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Northwestern University Bulletin

GENERAL CATALOGUE OF THE SCHOOL OF PHARMACY

1910-1911

UNIVERSITY OF ILLINOIS

PRESIDENT'S OFFICE

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Northwestern University

¶ THE COLLEGE OF LIBERAL ARTS, located at Evanston, in an ideal college community, offers special preparation for the professions, and for pursuits requiring broad training.

¶ THE MEDICAL SCHOOL is one of the oldest, largest, and best equipped. Seven hospitals are open to students. Clinic material is abundant.

¶ THE LAW SCHOOL, the oldest law school in Chicago, offers unexcelled library facilities and special courses that prepare for immediate practice in any state upon graduation.

¶ THE COLLEGE OF ENGINEERING has its own building just completed, beautifully situated, a model of efficiency. Offers courses in all branches of Engineering. Technical studies in a University environment.

¶ THE SCHOOL OF PHARMACY offers a scientific training in Pharmacy, Chemistry, and Drug and Food Analysis. Special courses for Drug Clerks.

¶ THE DENTAL SCHOOL offers expert training in theory and practice. Facilities are unsurpassed. Its clinic is the largest in the world.

¶ THE SCHOOL OF MUSIC affords a scientific preparation for music as an accomplishment and a profession. It is located at Evanston.

¶ THE SCHOOL OF COMMERCE provides instruction in economics, elementary and corporation finance, commercial law and accounting. Many lecturers from business and professional life.

¶ EVANSTON ACADEMY prepares for college, for engineering, for professional schools, and for business.

Northwestern University School of Pharmacy

UNIVERSITY OF ILLINOIS

The Calendar

April, 1910 to July, 1911

PRESIDENT'S OFFICE

1910

- Apr. 5, Tue. Examinations begin, Graduate in Pharmacy course
Apr. 5, Tue. Recess, to Sunday, April 10, inclusive, Pharmaceutical Chemist course
Apr. 11, Mon. Instruction resumed, Pharmaceutical Chemist course, first year class
Apr. 11, Mon. Alumni Banquet
Apr. 13, Wed. Graduating exercises, Graduate in Pharmacy course and three year Pharmaceutical Chemist course
May 30, Mon. Memorial Day
May 31, Tue. Senior examinations begin, Pharmaceutical Chemist course
June 7, Tue. Alumni Dinner
June 8, Wed. FIFTY-SECOND ANNUAL COMMENCEMENT
June 18, Sat. Year's work ends, Pharmaceutical Chemist course
Sept. 26, Mon. First day of registration
Sept. 28, Wed. Lectures and class work begin
Nov. 24, Thu. Thanksgiving recess to Sunday, November 27, inclusive
Dec. 19, Mon. Christmas recess to Sunday, January 1, inclusive

1911

- Jan. 2, Mon. Instruction resumed
Feb. 22, Wed. Washington's Birthday
Apr. 4, Tue. Examinations begin, Graduate in Pharmacy course
Apr. 4, Tue. Recess, to Sunday, April 9, inclusive, Pharmaceutical Chemist course
Apr. 10, Mon. Instruction resumed, Pharmaceutical Chemist course, first year class
Apr. 10, Mon. Alumni Banquet
Apr. 12, Wed. Graduating exercises, Graduate in Pharmacy course and the three year Pharmaceutical Chemist course
May 30, Tue. Memorial Day
May 31, Wed. Senior Examinations begin, Pharmaceutical Chemist Course
June 13, Tue. Alumni Dinner
June 14, Wed. FIFTY-THIRD ANNUAL COMMENCEMENT
June 17, Sat. Year's work ends, Pharmaceutical Chemist course

Executive Committee of the School of Pharmacy

William Andrew Dyche, A.M., Ph.G.

Wilhelm Bodemann

Henry Sherman Maynard

Theodore Henry Patterson, M.D.

Charles Hamilton Avery

The Faculty

Abram Winegardner Harris, Sc.D., LL.D.

President

Oscar Oldberg, Pharm.D.

Dean, Professor of Pharmacy and Director of the Pharmaceutical Laboratories

(On leave of absence 1909-1910 and 1910-1911)

Thomas Victor Wooten, Ph.G.

Administrative Officer, Lecturer on Pharmaceutical Economics

William Edward Quine, M.D., LL.D.

Emeritus Professor of Physiology, Therapeutics and Toxicology

Harry Mann Gordin, Ph.D.

Professor of Chemistry and Director of the Chemical Laboratories

Maurice Ashbel Miner, Pharm.M.

Assistant Professor of Pharmacy, in charge of the Manufacturing Laboratory

Charles Waggener Patterson, Sc.B., Ph.C.

Assistant Professor of Organic Analytical Pharmaceutical Chemistry, in charge of the Organic
Chemical Laboratories

Harry Kahn, Pharm.M., M.D.

Assistant Professor of Physiology and Materia Medica

Eugene Shaw Willard, D.D.S.

Assistant Professor of Bacteriology

Gerhard H. Jensen, Ph.D.

Assistant Professor of Botany and Pharmacognosy

William Henry Harrison, Ph.C.

Instructor in the Chemical Laboratories

George Daniel Oglesby, Ph.C.

Lecturer in Pharmacy

John Ferdinand Fischnar, Ph.C.

Instructor in the Dispensing Laboratory

Ernest Woollett

Instructor in Accounting and Business Methods

James Lewis Clay, Ph.C.

Assistant in the Chemical Laboratories

Louis Richard Wernecke, Ph.C.

Assistant in the Manufacturing Laboratory

Northwestern University

Northwestern University was founded in 1851. The property and endowments of the University are valued at more than nine million dollars. Its faculties include 379 teachers. Its libraries contain about 225,000 bound volumes and pamphlets. The total enrollment of students in 1909-1910 was 4487. Its degree-conferring departments include the College of Liberal Arts, the College of Engineering, and the Schools of Medicine, Law, Pharmacy, Dentistry, Music and Commerce.

LOCATION OF THE UNIVERSITY

The University Campus in Evanston has an area of about seventy-five acres and is beautifully situated on the shore of Lake Michigan, about two miles from the northern limits of the city of Chicago. On it are the buildings of the College of Liberal Arts, the College of Engineering, Garrett Biblical Institute, the Academy, the School of Oratory, the Orrington Lunt Library, and the new Gymnasium. The School of Music and the women's dormitories—Willard Hall, Persons Hall, and Chapin Hall—are on Willard Hall Campus, distant from the University Campus about three minutes' walk. The Medical School is in Chicago, between 24th and 25th Streets on Dearborn. The Schools of Law, Pharmacy, Dentistry, and Commerce are in the University Building, at the corner of Lake and Dearborn Streets.

The School of Pharmacy

The School of Pharmacy, established in 1886, has an equipment valued at more than \$25,000. It is housed in a manner well suited in all respects to the needs of its students.

The average attendance is 200 and there are now nearly 2000 Alumni. Its students come from all parts of the United States.

The School was established to meet the growing need for more thorough training in pharmacy, a field theretofore little cultivated in this country. It has trained its students to select, test, prepare and properly dispense drugs, medicines and drug merchandise. The School's fidelity to this mission for twenty-three years is everywhere recognized.

The urgent necessity for scientific training on the part of those whose work is so closely identified with the health of the people is now generally recognized. Every year it is better understood that the intelligent, conscientious preparation of medicine is second in importance only to the skill of the physician who determines what the patient's ailment is, and what remedies are to be used to effect a cure.

NORTHWESTERN UNIVERSITY BUILDING,
THE HOME OF THE SCHOOL OF PHARMACY

University Building, at Lake and Dearborn Streets, Chicago, has been fitted for the uses of the Pharmacy School, the Law School, the Dental School and the School of Commerce. Situated in the business center of Chicago, within the loop of the elevated roads, the School is reached by students readily and quickly, no matter in what part of the city they reside.

The building has a frontage of 180 feet on Dearborn and 160 feet on Lake Street. An inner court, 90 by 60 feet, makes the light from the court side of the rooms equal to that from the street side. It is seven stories high and substantially built.

The Pharmacy School occupies the entire fourth floor. The Law School occupies the third floor, the School of Commerce the second, and the Dental School the fifth, sixth and seventh.

On the second floor is located the Assembly Hall, used for University gatherings of various sorts.

LOCATION

The School of Pharmacy could not be more centrally located. It is easily accessible to the eleven hundred drug stores in Chicago and its suburbs, and is within a few blocks of all the wholesale drug houses and the dealers in chemical apparatus and supplies.

The great public libraries, of which there are a number in Chicago, are near at hand.

A quiet residence district near Lake Michigan may be reached in a few minutes' walk from the School. Rooms and boarding places can be readily secured there at moderate rates. Eating houses abound throughout the city and there is an excellent lunch room in the University Building itself.

INSTRUCTION

All the courses of instruction in this School are given exclusively to students of pharmacy. In these circumstances the teachers are enabled to specialize to the fullest extent, a fact of marked advantage to their students.

The American Conference of Pharmaceutical Faculties is a national association of the faculties of pharmaceutical schools, which have mutually agreed to maintain certain definite educational standards. The School of Pharmacy of Northwestern University is a member.

All members of the Conference receive equal recognition under the pharmacy laws of those states in which actual special education for phar-



IN the Manufacturing Laboratory. *The laboratories are the strength of the School of Pharmacy. They are large, well lighted, and fully equipped.*



A PORTION of the General Chemical Laboratory. *Here the student acquires that practical knowledge and experience of chemistry that goes far to make him an expert pharmacist.*



A Corner of the Students' Assembly Hall. Students need a place for recreation in odd hours. Here they have it, in congenial surroundings. Students and alumni are fitting up the room attractively.

macy is required or given any credit. In many of the states, however, actual systematic education for pharmacy is neither required nor given consideration; all that is necessary in those states is the passing of the State Board examination. Graduates of well equipped and rightly conducted pharmaceutical schools pass any proper examination. But in the states of Alabama, Arkansas, Delaware, Missouri and West Virginia the Boards of Pharmacy are required by the laws to license without examination all persons who may be graduates of those colleges of pharmacy which include a certain amount of drug store service among their graduation requirements.

THE LIBRARY

The School possesses one of the most valuable pharmaceutical reference libraries in this country. It now contains 1,490 bound volumes and 1,460 pamphlets. All the principal current chemical and pharmaceutical journals, foreign and American, are received, and are accessible alike to instructors and students.

The library includes complete sets of *Archiv der Pharmazie*; the *Centralblatt* from 1870 and the *Berichte der Deutschen Chemischen Gesellschaft* from 1868; also, complete from 1893, *Zeitschrift für analytische Chemie*, *Neueste Erfindungen und Erfahrungen*, *Berichte der Pharmazeutischen Gesellschaft*, *Journal of the London Chemical Society*, *Pharmazeutische Centralhalle*, and *Repertoire de Pharmacie*; complete sets of the *British Pharmaceutical Journal*, *Proceedings of the American Pharmaceutical Association*, and the *American Journal of Pharmacy*.

The library contains also all the pharmacopœias of the world with supplements to date, dispensatories and commentaries on the pharmacopœias, pharmaceutical and chemical encyclopedias and dictionaries, pharmaceutical and other technical formularies, the most valuable reference works and textbooks on chemistry, pharmacy, *materia medica*, and related subjects, and the publications of the American Chemical Society.

The library and reading room contain spacious tables for the use of students, and the reference works and textbooks most frequently consulted are conveniently accessible. The American pharmaceutical and drug journals are placed upon the tables as soon as received.

THE MUSEUM

The Museum contains more than 2,000 specimens of drugs, chemicals, pharmaceutical preparations, chemical and pharmaceutical apparatus and implements.

Authentic specimens of plant drugs, including many of special interest, are here shown, including not only exceptionally fine drugs, but also spurious ones. All plant drugs found in the drug markets are represented by good specimens.

The exhibits of chemical products are exceptionally large, and the exhibits of pharmaceutical products and sick-room supplies are instructive.

Specimens of numerous kinds of chemicals and preparations manufactured by students attest the practical character of the laboratory training.

THE LABORATORIES

Six large, well lighted, well ventilated laboratories are used in the several branches of the work. The classes are divided into sections so as to enable each student to receive as much as possible of the personal attention of the instructors.

The laboratories are of such size that 300 students may work at one time. These laboratories are fully equipped, and afford abundant work space for each student. The total floor space occupied is 11,000 square feet. Each laboratory is provided with storerooms, balance rooms, hoods and other requisites.

THE GENERAL PHARMACEUTICAL OR MANUFACTURING LABORATORY

This laboratory occupies a room about 60 by 40 feet, which is lighted by twelve large windows. It has individual accommodations for 288 students, the classes being arranged in four sections.

Students taking the course for the degree of Graduate in Pharmacy receive 300 hours' instruction in this laboratory and make from 150 to 200 preparations. Candidates for the degree of Pharmaceutical Chemist have, in addition, 84 hours' work in the production of organic chemical compounds.

THE GENERAL CHEMICAL LABORATORY

This room has a floor space of 1,800 square feet and individual accommodations for 216 students in three sections. It is well lighted, and good ventilation is maintained by means of an eight foot electric fan. Each student receives in this laboratory 200 hours' instruction during the first six months, and those taking the course for a degree of Pharmaceutical Chemist have here 135 hours' additional practice.

THE LABORATORY FOR ANALYTICAL PHARMACEUTICAL CHEMISTRY AND FOOD AND SANITARY ANALYSIS

This laboratory has individual work tables for sections of twenty-eight students at a time. These tables are unusually spacious, and additional work space is provided upon other large tables. Hoods and drying ovens, together with all the modern special apparatus and instruments requisite to thorough teaching, are included in the equipment of this laboratory as in the equipment of the other laboratories. Platinum dishes and crucibles and

other platinum ware are supplied in ample quantity, and only the best porcelain and glassware is used.

The weighing room, situated between the chemical laboratories, contains fifteen analytical balances of the best make, sensitive and accurate to the tenth of a milligram.

Students taking the course for the degree of Graduate in Pharmacy have forty-five lessons of three hours each in this laboratory. Students taking the course for the degree of Pharmaceutical Chemist have 240 hours' additional work.

THE LABORATORY FOR PHARMACEUTICAL BOTANY, MICROSCOPY AND PHARMACOGNOSY

The floor area of this laboratory is 1,224 square feet. It is a long room, with all the work tables placed against the eight large windows on one side of the room. The light is of the kind most suitable for microscopical work.

The department is well supplied with colored charts and plates, an ample stock of drugs, and all requisite apparatus such as section cutters and camera lucida.

The compound microscopes furnished to all students for the work in this laboratory are of Leitz's make, each supplied with one-inch and one-quarter-inch objectives, two eye-pieces, double nose-pieces, and other accessories.

Every student has fifty periods of instruction in this room, each of two hours' length, in each school year of the course for the degree of Graduate in Pharmacy, and students registered for the degree of Pharmaceutical Chemist receive forty-two hours' additional work in commercial microscopy.

THE DISPENSING LABORATORY

This laboratory is a room with a floor area of 1,450 square feet, with accommodations for over a hundred students divided into sections. From twenty to thirty students are assigned to each section.

The School of Pharmacy of Northwestern University was the first to introduce laboratory courses of instruction in the art of dispensing. Twenty-three years' practical experience has demonstrated the value of this course. Systematic training and a sufficient variety of technical work at the dispensing table can no longer be found in the retail drug store. A special dispensing laboratory is, therefore, at this time one of the most important features of the equipment of an efficient training school for pharmacists.

The dispensing laboratory of this School is equipped with an outfit of implements and apparatus many times as extensive as can be found in any drug store. Each student is taught how to use these tools in a workmanlike fashion.

Powders, pills, troches, capsules, tablet triturates, compressed tablets, ointments, plasters, suppositories, and a great variety of liquid mixtures,

including emulsions, are prepared under the direction of an experienced practical pharmacist.

Each student sees and does a greater variety of dispensing work in this laboratory than comes to an operator in any drug store in the course of several years, because the lessons (approximately 400) are carefully chosen, and are prepared examples illustrating all phases of manipulation, typical as well as exceptional.

Each student has fifty lessons of two hours each in this course.

Courses and Degrees

The degrees conferred are those of Graduate in Pharmacy, Pharmaceutical Chemist, Bachelor of Science in Pharmacy, and Master of Pharmacy. A Food and Drugs Course is also offered.

GRADUATE IN PHARMACY (PH.G.)

The course for the degree of Graduate in Pharmacy (Ph.G.) occupies two school years of six months each, when the student devotes his whole time to his studies and laboratory work, or two years of nine months each when he engages in concurrent drug-store employment and, accordingly, carries only two-thirds of the usual weekly program of studies.

PHARMACEUTICAL CHEMIST (PH. C.)

The course for the degree of Pharmaceutical Chemist (Ph.C.) extends through two school years of nine months each, with the student's whole time occupied with his studies and laboratory work. The three years' course for the same degree occupies the student's whole time through three school years of six months each. The program of work is the same as in the two years' course.

A POST GRADUATE COURSE

A post-graduate course is offered to Graduates in Pharmacy of other schools who have had sufficient preparation to complete the prescribed curriculum for the degree of Pharmaceutical Chemist in one additional year. In this course the work is modified in each case so as to enable the student to take such studies as he has not already pursued.

BACHELOR OF SCIENCE IN PHARMACY

The degree of Bachelor of Science in Pharmacy requires four years of satisfactory work, two years in the College of Liberal Arts and two years in the School of Pharmacy.

MASTER OF PHARMACY

The degree of Master of Pharmacy is conferred upon completion of three years of satisfactory work in the College of Liberal Arts and two years in the School of Pharmacy.

FOOD AND DRUGS COURSE

The curriculum prescribed for the degree of Pharmaceutical Chemist affords adequate training not only for the practice of pharmacy, but for the expert work required by the food and drug laws now being enacted. This curriculum is modified at the option of the students who desire to specialize more in the direction of the examination of food and drugs and who do not intend to practice pharmacy.

ELECTIVE COURSES

Students may be admitted, by special action of the Faculty, to such individual courses included in the program of work as they are qualified to pursue. The fees for such elective courses are in proportion to their extent, and full credit is given in the form of certificates for work satisfactorily completed.

CREDITS FOR WORK DONE IN OTHER SCHOOLS AND COLLEGES

Students who have satisfactorily completed the first year's work in any other approved college or school of pharmacy, upon presentation of proper evidence to that effect, are admitted to the second year class, provided the work done in each subject is fully equivalent to that of the first year's program of this School and provided that their work conforms to the rule that related subjects must be studied in logical sequence.

Credit is given, subject to the same conditions, for any courses in individual subjects satisfactorily completed elsewhere, so far as these subjects are included in the required studies of this School.

QUALIFICATIONS FOR ADMISSION

Candidates for the degree of Graduate in Pharmacy must, in accordance with the rule of the American Conference of Pharmaceutical Faculties, present evidence of having completed satisfactorily at least one full year of work in an accredited high school, or its equivalent, and must not be less than seventeen years of age.

Candidates for the degree of Pharmaceutical Chemist must have completed two years' work in a high school of accepted grade, or must possess an equivalent general education.

REQUIREMENTS FOR GRADUATION

The requirements for graduation include regular attendance, the satisfactory completion of the prescribed program of work, good moral character and satisfactory deportment, and the settlement of all accounts.

Degrees are conferred at the Graduating Exercises held at the conclusion of the Graduate in Pharmacy course in April and at the general University Commencement in June. On these occasions all candidates for degrees are required to be present in person, the Oxford cap and gown being worn as the official dress.

Brief Summary of the Courses of Instruction

Courses for the Degree of Graduate in Pharmacy

First Year

A. DEPARTMENT OF THEORY AND PRACTICE OF PHARMACY

Professor Oldberg, Assistant Professor Miner, Mr. Harrison
and Mr. Oglesby

A1. to A7. Professor Oldberg. Three hours weekly.

A1. *Introductory lectures defining pharmacy and stating its functions and problems.*

A2. *The Pharmacopœia—Its objects, scope and construction.*

A3. *Weights and Measures*—Mass, volume and density. Principles of metrology. The Metric System. Commercial and medicinal weights and measures of America and of Great Britain. Balances and weights. Volume measures. Specific density and specific volume. Instruments and methods employed in the determination of specific gravity.

A4. *Elementary Materia Pharmaceutica*—Preparatory discussion of the various classes of materials employed in the preparation of medicines.

“Crude drugs,” organic and inorganic. Character and mixed composition of plant drugs. Pharmaceutical properties of their constituents, such as cellulose, starch, mucilage, pectin, sugar, albumin, fixed oils and fats, tannin, bitters, volatile oils and related substances, resinous matters, glucosides and other neutral principles, and alkaloids.

A5. *General Pharmaceutical Processes and Manipulations Whereby Medicinal Preparations are Made.* Heat and its practical applications in pharmaceutical operations. Heating apparatus and appliances. Mechanical division of drugs; cutting, crushing, grinding, contusion, trituration, sifting. Fineness of powders. Solution, filtration, evaporation, crystallization, precipitation. Sublimation and distillation. Maceration, digestion and percolation. Other methods. Apparatus used.

A6. *Galenical Pharmaceutical Preparations*—General description of the several classes of pharmaceutical products. Stock preparations and ex tempore preparations. Species, powders, confections, troches, masses, pills. Cataplasms, ointments, cerates, plasters, suppositories. Liquid mixtures, including emulsions. Solutions, waters, mucilages, syrups, glycerites. Alcoholic solutions. Infusions, decoctions, tinctures, wines, vinegars, fluid extracts and other liquid extracts. Solid extracts, oleoresins and precipitated resins. Other preparations.

A7. *Pharmaceutical Nomenclature*—Systematic and non-systematic names of drugs, chemicals and preparations. Value of latinized or latinic technical titles and their non-latinic equivalents. Principles of construction. Pronunciation and proper abbreviations.

A8. Assistant Professor Miner. Two periods weekly of three hours each.

Pharmaceutical Laboratory Practice—Work designed to familiarize the student with apparatus, processes and materials, and to apply the lessons taught in the didactic courses. This course in pharmaceutical and chemical operations includes the manufacture of a great variety of finished preparations. The work is done in the General Pharmaceutical or Manufacturing Laboratory and constitutes the first part of the practical training in operative pharmacy. The students are permitted to take away with them at the end of the year the preparations they make.

A9. Mr. Harrison. One hour weekly in the class room together with additional assigned text-book lessons.

Pharmaceutical Arithmetic—Instruction and practice in the solution of the every-day mathematical problems of pharmacy. These problems include weights and measures, doses, proportion, percentage, dilution and fortification and other examples in the computation and adjustment of strength of drugs and preparations, specific gravity and specific volume, etc.

B. DEPARTMENT OF CHEMISTRY

Professor Gordin and Mr. Harrison

B1. Professor Gordin. Three hours a week.

General and Inorganic Chemistry, theoretical and descriptive. The principles of the science. The chemical elements and their more important compounds. A course designed to lay the foundation necessary to the successful pursuit of the further work in this department.

B2 and B3. *Laboratory Work*—Professor Gordin and Mr. Harrison. Three laboratory periods of three hours each and one recitation hour each week.

B2. *Experimental Study* of the physical and chemical properties of the elements of greatest importance in the elucidation of chemical phenomena and the products of chemical action.

B3. *Qualitative Analysis*—Practical study of the methods of separation and identification of the principal bases and acids and of the reactions involved therein.

Analysis of inorganic substances and mixtures, the composition of which is unknown to the student.

Study of the reagents and methods employed in the application¹ of the identity and purity tests of the Pharmacopœia.

C. DEPARTMENT OF PHARMACEUTICAL BOTANY, MICROSCOPY AND PHARMACOGNOSY

C1. Doctor Jensen. One lecture hour and two laboratory periods of two hours each, a week.

The Optical Properties of Mirrors and Lenses and the Mechanism and Manipulation of the Microscope—The organs, tissues and microscopical structure of plants and plant drugs. Cell contents and their recognition. This course constitutes the necessary preparation for the practical study of vegetable drugs. (Course C2, page 17.)

D. HUMAN ANATOMY AND PHYSIOLOGY

Assistant Professor Kahn. Lectures one hour each week. A course designed to give the student such a knowledge of the human body and its organs and functions as will enable him to understand in a general way the processes of nutrition, circulation, respiration, and the mode of action of drugs.

Second Year

A. DEPARTMENT OF THEORY AND PRACTICE OF PHARMACY

Professor Oldberg, Assistant Professor Miner, Assistant Professor Patterson,
Mr. Harrison and Mr. Fischnar

A10 to A13. Professor Oldberg. Three hours a week.

A10. *The Individual Galenical Preparations of Organic Drugs*—Their pharmacy and its relation to their chemical constituents. The important preparations of the Pharmacopœia and the National Formulary are fully discussed in this course.

A11. *The Inorganic Chemical Preparations*—Applied inorganic pharmaceutical chemistry. General principles governing the manufacture of chemicals, especially such as may be successfully and profitably made by practicing pharmacists without any other apparatus than that which is necessarily included in the outfit of every properly equipped pharmacy.

The organic pharmaceutical chemicals and their pharmacy also receive due attention in this course.

A12. *Extempore Operative Pharmacy—Extempore Preparations* of the pharmacopœias and formularies. How they are made.

Physicians' prescriptions and their construction and interpretation. The dispensing department and the art of dispensing. General and special rules. Incompatibilities.

The text used consists of a collection of thousands of formulas and prescriptions, exceptional as well as typical, showing the greatest variety of construction, phases of manipulation, ingredients, and difficulties requiring special treatment. These examples in extempore operative pharmacy have been compiled expressly for the purpose of placing before the students a more extensive and instructive variety of problems than will be found in the prescription files during many years of active work in the busiest of representative drug stores. The collection is in book form, so that teacher and students can analyze and discuss the examples together in order to cultivate and test the student's ability to decide upon the best way to meet each problem, and to detect errors and incompatibilities.

A13. *The Duties and Responsibilities of Pharmacists and Their Agents.* Pharmacy laws. The relation of pharmacists to the medical profession and the public. Pharmaceutical ethics.

A14. Assistant Professor Miner. Two periods weekly of three hours each.

Senior Laboratory Course in the manufacture of pharmaceutical preparations, galenical and chemical, organic and inorganic, official and unofficial.

The extraction and purification of important natural constituents of plant drugs.

Each student makes a large variety of finished products, including important and commonly used preparations of the Pharmacopœia and the National Formulary, especially those which can and should be made by the practicing pharmacist.

Special care is taken to prepare the student to do successfully and well the work which pharmacists are now called upon to do as the result of the active propaganda in favor of the use of U. S. P. and N. F. preparations in preference to proprietary products. Among the inorganic chemical preparations made are mercury compounds, bismuth compounds, granular effervescent salts, and many iron compounds including scale-salts. Among the organic substances made are aloin, salicin, amygdalin, piperin, salicylic acid, oil of cloves and natural benzoic acid. Each student is permitted to keep samples of the preparations he makes.

Hundreds of products made by the students are shown in special exhibits at the school.

A15. Mr. Fischner. Two laboratory periods a week of two hours each in the Dispensing Laboratory, and a course of six special lectures on sick-room supplies and "druggists' sundries."

The Laboratory Course in Dispensing is of the utmost importance in the practical training of pharmacists.

The service at the dispensing table comprises the crowning functions of the pharmacist. It is most effectively taught in a special laboratory equipped with all the facilities, apparatus and variety of materials at the command of a competent teacher, who has had ample experience in the practice of pharmacy.

The Special Lectures include instruction in regard to the miscellaneous medicinal and pharmaceutical preparations and sick-room requisites supplied by all well-equipped retail drug stores. These articles include such things as are not made by pharmacists themselves as, for instance, troches, coated pills, filled gelatin capsules and other like ready-made pharmaceutical products; infant foods and other dietetic supplies; sanitary and surgical preparations, appliances and dressings; rubber goods, atomizers, sick-room apparatus and glassware, and the various other articles necessarily furnished by the pharmacist. How such supplies are best kept in good condition. These articles are exhibited to the class.

A16. Mr. Harrison. One hour a week in the class-room together with additional assigned text-book lessons.

Pharmaceutical Chemical Problems—Exercises in writing equations and in solving problems relating to applied pharmaceutical chemistry.

B. DEPARTMENT OF CHEMISTRY

Professor Gordin, Assistant Professor Patterson and Mr. Harrison

B4. Professor Gordin. Three hours a week.

Organic Chemistry—The principles of the chemistry of the combustible carbon compounds. Their structure, classification and methods of production. Organic substances important to pharmacy, including the so-called "synthetics," are given special attention.

This course fits the student to pursue intelligently the courses in organic pharmaceutical testing, drug assaying, the production of organic chemical preparations and other practical laboratory work, and to understand fully the text of the pharmacopœia descriptive of the organic chemicals, alkaloids, volatile oils, etc.

B5. Assistant Professor Patterson. Forty-five laboratory periods of three hours each.

Volumetric Analysis and Pharmaceutical Testing—Principles and methods. Practice in the preparation and use of standard volumetric test solutions. Alkalimetry and acidimetry and other volumetric analytical processes. Indicators and their uses.

Practice in the application of the purity tests prescribed in the Pharmacopœia, and in the volumetric quantitative examination of important chemical preparations by the official methods; also the determination of alcohol

in tinctures, fluid extracts and other alcoholic liquids; the valuation of pepsin, etc.

The assaying and standardization of opium and its preparations is introduced at the end of this course.

C. DEPARTMENT OF BOTANY, MICROSCOPY AND PHARMACOGNOSY

Doctor Jensen. Two laboratory periods a week of two hours each.

C2. *Pharmacognosy*—Study of the organic crude drugs. The most important drugs are thoroughly studied with the aid of the microscope. This course is designed to develop a capacity to interpret and apply the pharmacopeial descriptions for the identification of individual drugs and to form a correct judgment of their quality.

Good specimens of about two hundred of the most important plant drugs are furnished to each student for this work.

E. MATERIA MEDICA AND THERAPEUTICS

Assistant Professor Kahn. Two lectures a week.

The properties, action, uses and doses of drugs and medicines, including so much of therapeutics and toxicology as is indispensable to the intelligent and safe practice of pharmacy. Instruction is also given in relation to "first aid to the injured" and other emergency aid which pharmacists may properly render.

F. PHARMACEUTICAL ECONOMICS

Mr. Wootea. One lecture a week throughout ten weeks.

This course was established to meet the needs of students who have had no drug store training, as well as of those whose training has been inadequate, in order to provide a knowledge of the business side of pharmacy. The work embraces business building, methods of gaining and retaining patrons and of establishing and maintaining proper business relations between the pharmacist and the public, the pharmacist and the physician, and the pharmacist and his fellow pharmacists. It includes such subjects as advertising, salesmanship, buying, the arrangement and care of stock and the proper conduct of a pharmacy with regard to approved commercial methods, economy, etc., to the end that the practice of pharmacy may be financially profitable.

Mr. Woollett gives a short course (G) of class exercises, designed to teach the student accounting, including the essentials of the business methods necessary in conducting the affairs of a drug store.

The course in *Urine Analysis* (Course B8) is also offered to students registered as candidates for the degree of Graduate in Pharmacy. The fee for this course when taken separately is fifteen dollars. It is given without additional cost in the course for the degree of Pharmaceutical Chemist.

Courses for the Degree of Pharmaceutical Chemist

All the courses for the degree of Graduate in Pharmacy as described in the foregoing pages constitute parts of the curriculum for the degree of Pharmaceutical Chemist. In addition, the following courses are required:

First Year

A. DEPARTMENT OF PHARMACY

Professor Oldberg. One lecture weekly through about six weeks.

A17. *Special Course on Miscellaneous Products* not treated of elsewhere, which are made or supplied by pharmacists, including sanitary and hygienic preparations, etc.

B. DEPARTMENT OF CHEMISTRY

B6. Professor Gordin and Mr. Harrison. Forty-five laboratory periods of three hours each, supplemented by one weekly recitation.

Gravimetric Analysis—Fundamental operations characteristic of general methods and special processes employed in the gravimetric determination of inorganic substances, including advanced modern methods and the application of this work to pharmaceutical and commercial requirements.

Pharmaceutical Testing (Course B5), as described among the second year courses in chemistry for the degree of Graduate in Pharmacy, is taken by students registered in the course for the degree of Pharmaceutical Chemist in the latter part of the first year. Forty-five laboratory periods of three hours each.

Second Year

A. DEPARTMENT OF PHARMACY

A18. Professor Oldberg. Six special lectures.

The Principal Pharmacopaias of the World—The general lessons taught by a comparison of the scope, style of construction, *materia pharmaceutica*, nomenclature, preparations, general directions and other important features of foreign pharmacopeias and formularies with those of the United States.

A19. Assistant Professor Miner. Twenty-eight laboratory periods of three hours each.

Organic Chemical Preparations—The production of organic chemical compounds of pharmaceutical importance or illustrating general methods.

Among the substances made by the students are ether, chloroform, iodoform, several organic acids, halogen derivatives of hydrocarbons, nitro benzene, aniline, urea, acetanilide, dithymol di-iodide, artificial oil of wintergreen, ethyl nitrite, ethyl acetate and various other esters.

B. DEPARTMENT OF CHEMISTRY

B7. Professor Gordin. About fourteen special lectures on *Important Chemical Constituents of Plant Drugs*, such as alkaloids and glucosides, and upon certain important practical applications of *Chemical Physics*, including the use of the polariscope and other instruments in chemical work.

B8. Assistant Professor Patterson. Twenty-four laboratory periods of three hours each.

Urine Analysis, qualitative and quantitative. The detection or determination of constituents of urine which are of importance in the diagnosis of disease.

B9. Assistant Professor Patterson. Forty laboratory periods of three hours each.

Advanced Course in Pharmaceutical Testing and Drug Assaying—A study of the principles and methods employed in the assay of drugs and preparations containing alkaloids, illustrated by laboratory practice in the assays of cinchona, extract of nux vomica, belladonna, aconite, guarana, etc. The examination of volatile oils, including the determination of important constituents, such as phenols, aldehydes, alcohols and esters. Practice in the determination of melting points and boiling points. Other quantitative determinations, such as the assay of spirit of nitrous ether and phenol. The valuation of pepsin, pancreatin and diastase preparations.

B10. Assistant Professor Patterson. Forty laboratory periods of three hours each.

Food and Sanitary Analysis—The examination of water to determine its potability and fitness for household use. The examination of milk, butter, baking powders and food products generally. This course includes laboratory practice in the determination of nitrogen by the Kjeldahl method and its modifications, the determination of the iodine absorption value, saponification value, etc. The detection of food preservatives, such as boric acid and borax, sodium benzoate and formaldehyde. Practice in the methods employed for determining specific gravity.

Physical examinations requiring the use of the polariscope, Zeiss Butyro-refractometer and Babcock milk tester are made.

C. DEPARTMENT OF BOTANY, MICROSCOPY AND PHARMACOGNOSY

Doctor Jensen. Twenty-one laboratory periods of two hours each.

C3. *Commercial Microscopy*—A course designed to train the student for the duties of the pharmaceutical chemist and public microscopist in the

examination of powdered drugs, spices and food products. Comparisons of pure and adulterated products.

The course includes work with the camera lucida and polariscope.

H. BACTERIOLOGY

Assistant Professor Willard—Thirty-nine laboratory periods of three hours each, through thirteen weeks.

Bacteria in health and disease. Preparation of culture media. Culture methods and methods of staining. The work usually required for sanitary purposes.

Program of Special Course for Food and Drugs Chemists and Inspectors

This program occupies six months, from September to April. It is open to graduates who have had the necessary preliminary courses in chemistry and other branches, embracing not less than twelve hundred hours' instruction and practical work in pharmacy, chemistry and *materia medica*.

The courses included in the program, subject to such modifications as may be called for by the students' preliminary work, are: A17, A18, A19, B6, B7, B9, B10 and C₃, together with either B8 or Course H.

General Statements

OCCUPATIONS OPEN TO GRADUATES

Applications made to this School for graduates to fill desirable positions have, for many years, exceeded the supply. As a rule, graduates secure positions, by mail or otherwise, in advance of leaving the School.

The occupations open to graduates include the drug business, wholesale and retail; modern professional pharmacy; positions as pharmacists in the Army, Navy, and the Public Health and Marine Hospital Service; as hospital pharmacists; work under the national, state and municipal governments in connection with the enforcement of the food and drugs laws; and employment in manufacturing and wholesale establishments in connection with the production and examination of foodstuffs and medicines.

PHYSICAL AND SOCIAL NEEDS OF STUDENTS

One of the striking events of the present school year will be the opening of the new gymnasium of the University in Evanston. This magnificent structure is a credit to Northwestern, being one of the finest in the entire country. Although the professional schools cannot use this excellently equipped building as much as might be desired on account of its location,

students from these schools enter the various teams, take part in the contests and enjoy all the privileges of the gymnasium. There is a nominal fee for use of a locker.

The School of Pharmacy has its own baseball and football teams.

The central department of the Young Men's Christian Association is within a few blocks of the school. Gymnasium, natatorium and other privileges may be there obtained by students of the School of Pharmacy at especially low rates. The Association's auditorium and parlors are most attractive and afford young men much pleasure at trivial cost.

Throughout the school year social entertainments are occasionally given.

LACK OF PRELIMINARY EDUCATION

Many young persons desirous of entering a good school of pharmacy find themselves handicapped by insufficient preparation.

Chicago offers many opportunities for making up a deficiency of this sort. At least half a dozen schools are available, having both day and evening classes. Work in them may be done concurrently with some work in the School of Pharmacy.

NOTES

For twenty-four years the needs of students of Pharmacy have been carefully studied by the Faculty of this School. The teaching methods employed are based upon the knowledge thus gained. The welfare of each individual student is a matter of personal interest to every instructor.

In every department of the School, teaching and equipment have constantly kept pace with the pharmaceutical progress.

The School was the first to fit up a separate laboratory wherein students are taught to dispense properly and to master prescription difficulties.

The diplomas of this School command respect everywhere. The demand for its graduates is far greater than the supply.

Only a part of the training necessary for pharmaceutical work can be gained in a drug store.

It is impossible to master any scientific-technical subject without systematic course of instruction, including laboratory practice in a well conducted school or college. Of pharmacy this is especially true.

Meetings of Northwestern University Pharmaceutical Association are held weekly during the school year with discussions on business and ethical problems of interest to all who expect to practice pharmacy. Friendly and earnest discussion of these subjects secures large educational benefit.

A result of the enactment of the Food and Drug laws is the increased demand for educated men in the establishments which manufacture or handle goods coming under legal supervision, and this demand seems likely to become greater year by year. Systematic training is necessary for those who undertake this work.

It may be noted that the class in this School which took the Pharmaceutical Chemist course during the present term is the largest in the history of the School.

The attendance at this School from 1886 to 1910 makes a total of approximately 3,500 different individual students. With one exception, every state in the United States has been represented in these classes. Over twenty states are represented each year. The alumni, to the number of nearly 2000 are distributed over the whole country.

FEES AND EXPENSES

The matriculation fee is \$5, and payment of this fee is necessary to secure enrollment. It is payable but once and before admission to the School. Before instruction begins, the matriculates are assigned to their respective classes in the laboratories and recitation rooms and allowed to select tables and seats in the order of enrollment.

The annual fee for tuition and materials for the course leading to the degree of Graduate in Pharmacy is \$100. Students registering for the course leading to the degree of Pharmaceutical Chemist are required to pay an additional fee of \$40.

A laboratory deposit of \$10 is required of each student. This fee is to cover breakage or loss of apparatus and damage to other property. All unexpended portions of laboratory deposits are refunded at the close of the school year, after deducting \$3 for use and maintenance of microscopes, balances and other apparatus.

The diploma fee, payable two weeks before graduation is \$10.

Lockers are provided for all students without fee. Certain indispensable articles that render the work effective and orderly (not materials consumed) are furnished by the school for the convenience of students. These articles include note books, drawing books, dissecting needles for use in the microscopical laboratory, aprons and sleeves, additional pieces of apparatus required to replace those broken or lost, and other items. A coupon ticket to the amount of \$5 is used for the purpose of procuring these articles when needed, and supplies of this kind are furnished in no other way. Unused coupons are redeemed at the end of the year or whenever the student discontinues his attendance and settles his accounts.

No tuition or other fees are refunded except in case of the student's illness. In that case, if the student presents a certificate from a physician that he is unable to remain in attendance, one-half of the current semester's fees will be refunded, provided application is made before the middle of the semester.



IN the Library. *This is a University School of Pharmacy, and so it is not satisfied to do practical work only. The Library has the best American and foreign journals and books of reference.*



THE 1909 Foot Ball Team. *This football team was the pride of the students in the autumn of 1909. The School has a few social interests: this is one of them. An excellent orchestra is another.*



A Quiz in Chemistry. *The quiz is essential to assure the instructor that the student is mastering the theory of the subject. A fire of questions tests the student, clarifies his knowledge, stimulates responsibility.*

EXPENSE OF BOARD AND ROOMS

Within walking distance of the School is a quiet residence portion of the city near Lake Michigan. In this section room and board together may be obtained at from \$4.50 to \$6.00 per week. A less expensive way to live, however, is for two or several students to rent rooms together, either single or *ensuite*, and take their meals in one of the many excellent restaurants with which the city abounds.

Complete information regarding all of these matters may be obtained of the Young Men's Christian Association secretary in the corridor of Northwestern University building, who assists students also in finding employment.

EARNING ONE'S WAY

To assist worthy students who are unable to pay their way through school without at the same time taking employment, the administrative office of the School is able to render efficient service. Familiarity with the business conditions in Chicago and large acquaintanceship with the druggists of the city give us unusual opportunities for placing young men in good drug stores at satisfactory remuneration. But store work should not be undertaken unless it is financially unavoidable. The Faculty believes that, in justice to their studies students should, if possible, entirely forego this work during the school term.

Students are often assisted by the Young Men's Christian Association to secure miscellaneous work at odd hours. There is no fee for this assistance.

Accordingly, men who are compelled to work their way through school should not hesitate to come to Chicago provided they have some money with which to begin their school work. Students who contemplate working to help pay their expenses should make this fact known as soon as possible.

Requests for information concerning any feature of the school's work should be addressed to The School of Pharmacy, Northwestern University Building, Lake and Dearborn Streets, Chicago.

OFFICERS OF THE ALUMNI ASSOCIATION

President, Charles A. Storer, '88

Vice-President, William H. Harrison, '03

Vice-President, George C. Hansen, '05

Vice-President, Ralph H. Smith, '94

Treasurer, Henry F. Schaper, '93
Secretary, George D. Oglesby, '91

Trustees

Henry F. Hauth, '07
Otto R. Peters, '08
Joseph F. Dvorak, '08

All alumni of the School are requested to keep the officers of the Association informed as to their location. At present many cannot be reached by letters or other communications because their addresses are unknown. Inquiries at the School for such alumni cannot be answered, a fact which not infrequently is to them a distinct disadvantage.

Items of interest in relation to the alumni will be gladly received and frequently published. Send all communications to

George D. Oglesby, Secretary
228 Thirty-first Street, Chicago

PROSPECTIVE STUDENTS

Prospective students are requested to send their names and addresses with information as to age and general education. Tear off this half page on the dotted line and mail it to the School of Pharmacy of Northwestern University, 87 Lake Street, Chicago.

As a prospective student I desire to be placed on the mailing list of the School of Pharmacy to receive circulars and other information

My age is.....

General education.....

I intend taking the course for the degree of.....

Remarks.....

Signed.....

Address

Graduates of 1909

DEGREE OF PHARMACEUTICAL CHEMIST

Browder, Jay Orison, Detroit, Mich.	King, Frank Ray, Charlotte, Mich.
Coburn, Ernest Harlan, Portsmouth, Ohio.	King, Lloyd August, West Milton, Ohio.
Finlay, Matthew Marion, Bowen, Ill.	Kolb, Max William, Patch Grove, Wisc.
Frericks, Andrew Gerard, Quincy, Ill.	Schwerdt, Louis I., Chicago, Ill.
Gallardo, Marcelino Mendoza, Philippine Islands.	White, John Calhoun, Dallas, Texas.
Galligan, James Patrick, Hegewisch, Ill.	Wold, Guy Kenneth, Austin, Minn.
Jameson, Philip Emile, Chicago, Ill.	Zobel, Roy Ernest, Leadville, Colo.

DEGREE OF GRADUATE IN PHARMACY

Adams, Alva Lee, Winnetka, Ill.	McElrath, Walter I., Chicago, Ill.
Arnold, Arthur Stanley, Rockford, Ill.	McKibbin, John Leslie, Sheldon, Ill.
Bantug, Jose Policarpio, Philippine Islands.	McLuen, Maurice Carson, Guthrie Center, Iowa.
Beless, James Warren, Salt Lake City, Utah.	Nordvold, Sverre P., Zumbruto, Minn.
Brecht, Paul A., Yankton, So. Dak.	Oswald, Louis William, Naperville, Ill.
Claypool, William Edward, Peoria, Ill.	Panzer, George Otto, Hastings, Nebr.
Cotton, Charles Arthur, Cedar Falls, Iowa.	Rizos, Alexander Constantine, Omaha, Nebr.
Crain, Charles Raymond, Chicago, Ill.	Rogers, Foster Rob, Kirtley, Wyo.
Deweys, Glenn Griffin, Poy Sippi, Wisc.	Samson, Bernardo, Philippine Islands.
Dodd, John M., Marion, Ill.	Scholes, John Hunter, Bradford, Ill.
Finlay, Matthew Marion, Bowen, Ill.	Seaton, Charles Edward, Hotchkiss, Colo.
Gaeth, Chauncey William, Schuyler, Nebr.	Schulze, William C., Racine, Wisc.
Galligan, James Patrick, Hegewisch, Ill.	Shultz, Albert Lester, Plano, Ill.
Green, Walter Edgar, Salt Lake City, Utah.	Sweetland, Melvin Dale, Highland Park, Ill.
Holmes, Charles Bernard, Chicago, Ill.	Tarbell, Nell Williamson, Watertown, So. Dak.
Huff, Arthur W., Bremen, Ind.	Terry, Clifford H., Humboldt, Ill.
Hyrum, James Lester, Odell, Ill.	Wagner, Walter S., Morris, Ill.
Jennings, John Wesley, Port Gibson, Miss.	Warren, Roy, Batavia, N. Y.
Loeffelbein, Charles Augustus, Grand Rapids, Wisc.	Watson, Daniel Clark, Parowan, Utah.
Long, Walter Eugene, Evanston, Ill.	Wire, Leslie Harwood, Winslow, Ill.
Madden, St. Clair, Grayville, Ill.	Wold, Guy Kenneth, Austin, Minn.

List of Students 1909-1910

COURSE FOR THE DEGREE OF PHARMACEUTICAL CHEMIST

Students taking this course in two years of nine months each are indicated by (a); those taking it in three years of six months each are marked (b). Students marked (c) are not candidates for graduation.

Second Year

Adams, Alva Lee (b), Illinois.	Martin, Glenn Thomas (c), Illinois.
Abbott, Elmer Reed (b), Illinois.	McKamy, Frank Edwin (b), Illinois.
Ammermann, Walter Emil (a), Michigan.	McKelvey, Charles David (a), Indiana.
Carr, William Larrabee (a), Illinois.	Moran, John Alphonso (b), Colorado.
Carrick, Walter (b), Iowa.	Morrison, Earl Orin (a), Illinois.
Devlin, Edward (a), Illinois.	O'Brian, Lewis Etienne (b), Indiana.
Ekstam, Carl Fred (b), Iowa.	O'Rourke, James Patrick (a), Illinois.
Garn, George Wallace (b), Indiana.	Orr, Robert James (a), Illinois.
Graf, Joseph Peter (b), Iowa.	Pickard, Joseph Dwight (a), Illinois.
Harden, D. Gratton (b), Nebraska.	Porter, Carson Hosmer (b), Illinois.
Harris, Herbert Wilson (a), Illinois.	Quilling, Fred Albert (b), Wisconsin.
Hawley, Verne David (b), Illinois.	Ritter, Jay Bradley (c), Indiana.
Holabird, Harlow Clay, Jr. (b), Illinois.	Roth, Martin Arthur (b), Ohio.
Heinen, Johnie Michael (b), Indiana.	Russell, Adelbert Willis (b), Wisconsin.
Honeyman, James Shephard (b), Iowa.	Schoen, William Arthur (b), Minnesota.
Isham, Herbert Austin (b), South Dakota.	Shaver, Charles Darwin (a), Ontario, Canada.
Jacobson, Raphael (a), Illinois.	Sprague, Arthur Angell (a), Michigan.
Kaplan, Jay (a), Illinois.	Tabenski, Longin Louis (b), Illinois.
Kaufmann, Edward Samuel (b), Ohio.	Wagener, Herman Eugene (b), South Dakota.
Keely, Frank Martin (b), Illinois.	Walter, Harry George (a), Kansas.
Knochel, Joseph Martin (a), Illinois.	Warner, Benjamin Greeley (a), Texas.
Krafft, Walter Anthony (b), Illinois.	Winkley, George (a), Illinois.
Lappley, Harry Martin (b), Wisconsin.	Wyszynski, Walter (c), Illinois.
Ledwich, Demain J. (b), Nebraska.	Youngren, Emil W. (b), Illinois.
Lee, Chris Wilbur (a), Minnesota.	Zimmer, Arthur Philip (b), Illinois.
Lindemann, Armin Stoy (a), Indiana.	

First Year

Anderson, Charles Clyde (a), Illinois.	Buck, Roy Elmer (b), Illinois.
Baxter, David (b), Michigan.	Bull, George Emanuel (b), Illinois.
Babbitt, Harvey Clare (b), Nebraska.	Burns, Robert Dana (b), Colorado.
Bergman, Willard Louis (a), Illinois.	Carlson, J. Leland (b), Utah.
Bevis, Harry Roscoe (b), Illinois.	Clarke-Jones, Stanley (b), Illinois.
Bloomquist, Guy (b), Illinois.	Cooke, Clyde Wilson (b), Illinois.
Boarini, Edward Vincent (a), Illinois.	Coughlan, Robert Emmert (a), Illinois.

Cushing, Charles G. (a), Illinois.
Dahlberg, Alfred Eugene (c), Illinois.
Daudelin, Eugene Felix (b), Illinois.
Davis, Leslie Warren (b), Illinois.
Derebey, Harold Pericles (b), Illinois.
Donaldson, Robert W. (a), Illinois.
Donichy, Harry (b), Illinois.
Eftaxopoulos, Constantine S. (b), Illinois.
Erickson, Alfred Herman Oscar (b), Illinois.
Halliwell, John Phillip (b), Nebraska.
Hanson, Selmer, South Dakota.
Hefferman, Thomas Francis (a), Illinois.
Hill, Fred LeRoy (b), Illinois.
Hillebrecht, Herbert E. (a), Illinois.
Hoaglund, Clifford Paul (a), Iowa.
Hopkins, Ralph Eply (b), Wisconsin.
Johanson, Oscar H. (b), Illinois.
Johnson, Ewing Maine (b), Illinois.
Johnson, Melven Lloyd (b), Wyoming.
Marple, Richard Shepard (a), California.
Nesbit, Graham William (a), Utah.
Nolan, Mary Cecilia (a), Illinois.

Noyes, Wynne Charles (b), Nebraska.
Park, Edward Louis (b), Illinois.
Rothe, William George (b), Illinois.
Schaettgen, Arnold Fred (c), Iowa.
Schnable, George L. (c), Illinois.
Schuirmann, Hermann Gottlieb (a), Illinois.
Sebbes, Fred John (b), Illinois.
Seyfert, Max Charles (a), Ohio.
Shafron, William Jacob (b), Illinois.
Simpson, Leo M. (b), Nebraska.
Stewart, Roy Page (a), Illinois.
Stoll, Walter O. (a), Illinois.
Strassburger, Ernest (b), Wisconsin.
Striteskey, Albin John (b), Illinois.
Swenson, Knute E. (b), Montana.
Swift, Morton D. (a), Illinois.
Tanner, Winfred Erle (b), Illinois.
Thoma, Raymond Joseph (c), Illinois.
Van der Veer, Ord William (b), Nebraska.
Weech, Robert Walter (a), Oregon.
Wood, Cyrus B. (a), Illinois.
Zwack, John (b), Illinois.

COURSE FOR THE DEGREE OF GRADUATE IN PHARMACY

Second Year

Barnette, Earl, Nebraska.
Bellamy, Harley Leroy, Nebraska.
Bickhaus, Conrad Albert (c), Illinois.
Butler, George Dwight, Nebraska.
Cunningham, James Francis, Arkansas.
Duffy, Mark Matthew, Wisconsin.
Ellingson, William, South Dakota.
Ernst, Joseph Daniel, Illinois.
Folkrod, Cyril Clinton, Illinois.
Foresman, Mott, Iowa.
Geyer, Fred Jay, New Mexico.
Hughes, Earl Carlton, Nebraska.
Inskip, Frances J., Illinois.
Isted, Harry Frank, Illinois.
Kadlec, Edwin L., Illinois.
Kingsley, Wilbur Lloyd, Pennsylvania.
Kreiling, Edward Herman George, Illinois.
Lapjansky, Michael Anthony, Indiana.
Lauer, Matthias Tillman, Illinois.

First Year

Adams, William Charles, Illinois.
Adler, Samuel B., Illinois.
Allen, William Harry, Illinois.
Alley, Burr R., Nebraska.
Alexander, Henry Victor, Illinois.
Ball, Massey C., Texas.
Beiley, Fred W., Montana.
Bond, Robert Bruce, Illinois.
Brown, Vivus William, Wisconsin.
Browning, Frederick L., New Mexico.
Cady, Leo Melville, Colorado.
Campbell, Lloyd Bruce, Idaho.
Cline, Samuel Phil, Illinois.
Doerr, Albert Edward, Illinois.
Donnell, Madison Clayton, Texas.
Eikmeyer, Frank Henry (c), Iowa.
Engels, Nicholas Junior, Illinois.
Eppelsheimer, Samuel, Iowa.
Ferguson, James Robert, Illinois.
Gimbel, Charles Leo, Iowa.
Greensburg, Ralph, Illinois.
Hendrickson, Alfred, North Dakota.
Hendricksen, Waldemar H. (c), Illinois.
Henwood, Maxwell Butler, Illinois.
Hochschild, Tony Edwin, Wisconsin.
Hodapp, Michael Ehrhart (c), Iowa.
Jenkins, William Laud, Illinois.
Johnson, Bert Napoleon, Illinois.
Kaiser, Otto Henry (c), Michigan.
Karolewski, Joseph (c), Illinois.
Kelley, John Frances, Illinois.
Kendeigh, Clarence George, Colorado.
Kohlmann, Albert James, Iowa.
Kramer, Lee Edward, Illinois.
LeBoeuf, Hector Oliver (c), Illinois.
Lesoff, Alexander S. (c), Illinois.

Lehmann, Emil Ernest, Illinois.
Levitt, John Joseph, Illinois.
McAfee, John Allen, Colorado.
Miller, Edward, Illinois.
Mueller, William John, Minnesota.
Ohlson, Olof Howard, Illinois.
Peoples, Edward Lewis (c), South Dakota.
Peterson, Gustav Joseph (c), Oklahoma.
Purcell, Warner E., Illinois.
Rueckert, Fred Oswald, Illinois.
Savage, Percy Whitford, Montana.
Schopp, Thomas Henry, Illinois.
Sims, John Ray, Illinois.
Stiles, Thaddeus Cornelius, Illinois.
Stubbs, Robert Jackson, Georgia.
Wilson, Fred Douglas, Mississippi.
Witter, Clarence Porter, Illinois.
Worthington, Clyde Leonard, Illinois.

Little, Raymond Robert, Iowa.
Masset, James Frank, Wisconsin.
McCann, Edward Brice, Illinois.
Medow, Saul, Illinois.
Medow, William, Illinois.
McCarten, Sidney F. (c), Michigan.
Mackh, Carl August, Illinois.
Morrison, J. A., Illinois.
Musgrave, Jesse W., Illinois.
Mussner, William Seegmiller, Utah.
Neison, Edward Robert, Texas.
Neufeld, John (c), Iowa.
Newmann, Maurice Mayer, Illinois.
Nolting, Walter Otto, Illinois.
Olson, Joe Garfield, South Dakota.
Palumbo, Michael A., Illinois.
Painter, Clinton Blair, Illinois.
Purkey, Frank S., Arizona.
Renneckar, Carl Clayton, Illinois.
Richardson, Andrew (c), Illinois.
Schoen, Leslie A., Colorado.
Sempill, John Burgess, Illinois.
Singer, Claud Tate, Colorado.
Stoltz, Charles Benton, Illinois.
Sughrue, Daniel Francis, Illinois.
Summers, Roland McCord, Indiana.
Vurpillat, Joseph Bede, Indiana.
Wade, James William, Illinois.
Walker, Lee Carleton, Iowa.
Whelan, Mitchell (c), Illinois.
Whitson, Robert Arthur, California.
Williamson, Norman (c), Michigan.
Wilson, Ray Ervin, South Dakota.
Zleske, Arthur Aaron, South Dakota.
Zoub, Morris (c), Illinois.

Northwestern University

¶ NORTHWESTERN UNIVERSITY is an institution for the earnest and ambitious student, for the young man or woman who wants to make the most of himself and to appropriate the best that the University has to give him.

¶ NOT ONLY THE SCHOOL OF PHARMACY but all the departments of the University are equipped in instruction and apparatus to meet in the largest way the needs of the student.

¶ TO MANY, PERHAPS TO MOST STUDENTS, better education means sacrifice. The University appreciates this; indeed, the institution is itself built upon this principle. Its fees fairly cover much of meeting its expenses. Beneficence to the institution is, in fact, a gift to every student, securing to him his education at less than it costs.

¶ NORTHWESTERN HAS HAD A WORTHY HISTORY, but the future is to afford the students better privileges than ever. New resources provide new opportunities; a wiser use of the old resources will make them increasingly serviceable.

¶ COULD ANY UNIVERSITY BE MORE FAVORED in its site than one in Chicago and Evanston, the first the center of the strongest and best forces of our national life, the second the city's most beautiful suburb, set down by the Lake and marked from the beginning for the home of students?

¶ ADDRESS THE PRESIDENT FOR ANY INFORMATION regarding any department; visit the institution; give it the opportunity to serve you.

Evanston and Chicago



Northwestern University Building, Chicago
The Home of the School of Pharmacy

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1911-12

Northwestern University Bulletin

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UNIVERSITY OF ILLINOIS.

GENERAL CATALOGUE OF THE SCHOOL OF PHARMACY

1911-1912

Evanston and Chicago
Published by the University
April, 1911

Northwestern University

Northwestern University was founded in 1851. Its faculties include 388 teachers. Its libraries contain about 225,000 bound volumes and pamphlets. The total enrollment of students in 1910-1911 was 3,788. Its degree-conferring departments include the College of Liberal Arts, the College of Engineering, and the Schools of Medicine, Law, Pharmacy, Dentistry, Music, and Commerce.

The Campus in Evanston, beautifully situated on the shore of Lake Michigan, has an area of about seventy-five acres. On it are the buildings of the College of Liberal Arts, the College of Engineering, Garrett Biblical Institute, the Academy, the School of Oratory, the Library, and the Gymnasium. The School of Music and the women's dormitories are on Willard Hall Campus, about three minutes, walk from the main Campus. The Medical School is in Chicago, at Twenty-fourth and Dearborn Streets.

The University Building, at Lake and Dearborn Streets, Chicago, is the home of the Pharmacy School, the Law School, the Dental School and the School of Commerce. Situated in the business center of Chicago, within the loop of the elevated roads, the School is reached by students readily and quickly.

The building fronts 180 feet on Dearborn Street and 160 feet on Lake Street. An inner court, 90 by 60 feet, equalizes the light throughout the building. It is seven stories high and substantially built.

The Pharmacy School occupies the entire fourth floor. The Law School occupies the third floor, the School of Commerce the second, and the Dental School the fifth, sixth and seventh.

On the second floor is the Assembly Hall, used for University gatherings of various sorts.

Northwestern University School of Pharmacy

The Calendar

January 1911 to July 1912

LIBRARY

OF THE

UNIVERSITY OF ILLINOIS.

1911

- Jan. 3, Tues. Instruction resumed
Feb. 22, Wed. Washington's Birthday
Apr. 4, Tue. Examinations begin, Graduate in Pharmacy course
Apr. 4, Tue. Recess, to Sunday, April 9, inclusive, Pharmaceutical Chemist course
Apr. 10, Mon. Instruction resumed, Pharmaceutical Chemist course, first year class
Apr. 12, Wed. Alumni Banquet
Apr. 13, Thu. Graduating exercises, Graduate in Pharmacy course and the three year Pharmaceutical Chemist course
May 30, Tue. Memorial Day
May 31, Wed. Senior Examinations begin, Pharmaceutical Chemist course
June 13, Tue. Alumni Dinner
June 14, Wed. FIFTY-THIRD ANNUAL COMMENCEMENT
Sept. 25, Mon. First day of registration
Sept. 27, Wed. Lectures and class work begin
Nov. 30, Thu. Thanksgiving recess, to December 3, Sunday, inclusive
Dec. 21, Thu. Christmas recess, to January 2, Tuesday, inclusive

1912

- Jan. 3, Wed. Instruction resumed
Feb. 22, Thu. Washington's Birthday
Apr. 1, Mon. Examinations begin, Graduate in Pharmacy course
Apr. 1, Mon. Recess, to Sunday, April 7, inclusive, Pharmaceutical Chemist course
Apr. 8, Mon. Instruction resumed, Pharmaceutical Chemist course
Apr. 8, Mon. Alumni Banquet
Apr. 10, Wed. Graduating exercises, Graduate in Pharmacy course and three year Pharmaceutical Chemist course
May 30, Thu. Memorial Day
June 6, Thu. Senior examinations begin, Pharmaceutical Chemist course
June 12, Wed. FIFTY-FOURTH ANNUAL COMMENCEMENT
June 15, Sat. Year's work ends, Pharmaceutical Chemist course

Faculty

Abram Winegardner Harris, Sc.D., LL.D.
President

Oscar Oldberg, Pharm.D.
Dean, Professor of Pharmacy
(On leave of absence 1910-1911)

Arthur Herbert Wilde, Ph.D., S.T.B.
Acting Dean

William Edward Quine, M.D., LL.D.
Emeritus Professor of Physiology, Therapeutics, and Toxicology

Harry Mann Gordin, Ph.D.
Professor of Chemistry and Director of the Chemical Laboratories

Gerhard H. Jensen, Ph.D.
Professor of Botany and Pharmacognosy

Maurice Ashbel Miner, Pharm.M.
Assistant Professor of Pharmacy; Curator

Charles Waggener Patterson, Sc.B., Ph.C.
Assistant Professor of Analytical Pharmaceutical Chemistry; Secretary

Harry Kahn, Pharm.M., M.D.
Assistant Professor of Physiology and Materia Medica

Eugene Shaw Willard, D.D.S.
Assistant Professor of Bacteriology

Rollin Guizot Myers, M.S.
Instructor in the Chemical Laboratories

George Daniel Oglesby, Ph.G.
Lecturer in Pharmacy

John Ferdinand Fischnar, Ph.C.
Instructor in the Dispensing Laboratory

James Lewis Clay, Ph.C.
Assistant in the Chemical Laboratories

Jay Kaplan, Ph.C.
Assistant in the Manufacturing Laboratory

Northwestern University School of Pharmacy

Students attending Northwestern University School of Pharmacy enjoy all the privileges assured by connection with a great endowed University whose present enrolment (1910-11) is 3,788.

The School has attained the highest standing by its long and honorable career of earnest work for the betterment of pharmacy and pharmaceutical education. It celebrates its twenty-fifth anniversary in April, 1911.

The School has a large faculty of experienced teachers and specialists, a majority of whom were long engaged in the practice of pharmacy before they became connected with this institution. These teachers are, therefore, fully able to appreciate the needs of pharmacy and to make the courses of instruction thoroughly practical, which accounts for the great demand for graduates of this School.

The value of the equipment used exclusively for the students of pharmacy is over \$25,000—five times the amount required of the "Registered Schools of Pharmacy" under the laws of New York.

The two established college courses in pharmacy in the United States are the course for the degree of Graduate in Pharmacy and that for the degree of Pharmaceutical Chemist. Both courses are given in this School and the programs are so arranged that all the work for the degree of Ph.G. is completed in the usual two years of six months each, and all the work required for the degree of Ph.C. in two years of nine months each, provided the students do not divide their time between drug store employment and their college work, as is done by more than one-half of the students of pharmacy in this country. Students financially able to take a two years' course with a full time program of college work should not be satisfied with less. The customary two years' course with a half time program gives the student only three days a week for his college work. The laboratory courses alone in this School occupy three full days weekly. Half-time courses are justifiable only on the ground that a large number of pharmacy students are financially unable to do better.

Students are encouraged to take the most substantial course given. At the end of the first six months of the year, being on the ground and in the right condition to continue, they can remain three months longer without changing their boarding places, if satisfactory, and without added expense for travel complete the longer course for a relatively trifling additional fee, or they may take the longer course in three years of six months each if they prefer that plan.

Students coming from other schools with credits are not re-

quired to repeat courses satisfactorily completed, but are given advanced standing and special programs fully occupying their time, unless they prefer to take some of their work over again, which many do when they learn the scope and methods of the work in this School.

The physical, social and moral welfare of the students receive careful attention. The advantage of association with the students of all the other schools of the University is great. The magnificent new gymnasium building and the great athletic fields bring many intercollegiate games to Northwestern and give the students opportunities to participate in and to witness these events under the most favorable conditions.

LOCATION

The School of Pharmacy could not be more centrally located. It is easily accessible to the eleven hundred drug stores in Chicago and its suburbs, and is within a few blocks of the wholesale drug houses and the dealers in chemical apparatus and supplies.

The great public libraries, of which there are a number in Chicago, are near at hand.

A quiet residence district near Lake Michigan may be reached in a few minutes' walk from the School. Rooms and boarding places can be readily secured there at moderate rates. Eating houses abound throughout the city and there is an excellent lunch room in the University Building itself.

THE LABORATORIES

Six large, well lighted, well ventilated laboratories are used in the several branches of the work. The classes are divided into sections so as to enable each student to receive as much as possible of the personal attention of the instructors.

The laboratories are of such size that 300 students may work at one time. These laboratories are fully equipped, and afford abundant work space for each student. The total floor space occupied is 11,000 square feet. Each laboratory is provided with storerooms, balance rooms, hoods and other requisites.

THE GENERAL PHARMACEUTICAL OR MANUFACTURING LABORATORY

This laboratory occupies a room about 60 by 40 feet, which is lighted by twelve large windows. It has individual accommo-



THE LABORATORY OF BOTANY, MICROSCOPY, AND PHARMACOGNOSY. Here the student learns to identify drugs and to form a correct judgment of their quality. About two hundred specimens of the most important plant drugs are supplied to each student for this work.

DEAN OLDBERG,
who this year completes
a quarter of a century of
service to the School of
Pharmacy.





IN THE MANUFACTURING LABORATORY. The laboratories are the strength of the School of Pharmacy. They are large, well lighted, and fully equipped.



NORTHWESTERN
UNIVERSITY BUILD-
ING, LAKE AND
DEARBORN STS.,
CHICAGO. The home
of the Schools of Phar-
macy, Law, Dentistry,
and Commerce.

dations for 288 students, the classes being arranged in four sections.

Students taking the course for the degree of Graduate in Pharmacy receive 300 hours' instruction in this laboratory and make from 150 to 200 preparations. Candidates for the degree of Pharmaceutical Chemist have, in addition, 84 hours' work in the production of organic chemical compounds.

THE GENERAL CHEMICAL LABORATORY

This room has a floor space of 1,800 square feet and individual accommodations for 216 students in three sections. It is well lighted, and good ventilation is maintained by means of an eight foot electric fan. Each student receives in this laboratory 200 hours' instruction during the first six months, and those taking the course for the degree of Pharmaceutical Chemist have 135 hours' additional practice.

THE LABORATORY FOR ANALYTICAL PHARMACEUTICAL CHEMISTRY AND FOOD AND SANITARY ANALYSIS

This laboratory has individual work tables for sections of twenty-eight students at a time. These tables are unusually spacious, and additional work space is provided upon other large tables. Hoods and drying ovens, together with all the modern special apparatus and instruments requisite to thorough teaching, are included in the equipment of this laboratory as in the equipment of the other laboratories. Platinum dishes and crucibles and other platinum ware are supplied in ample quantity, and only the best porcelain and glassware is used.

The weighing room, situated between the chemical laboratories, is well equipped with good analytical balances.

Students taking the course for the degree of Graduate in Pharmacy have forty-five lessons of three hours each in this laboratory. Students taking the course for the degree of Pharmaceutical Chemist have 240 hours' additional work.

THE LABORATORY FOR PHARMACEUTICAL BOTANY, MICROSCOPY AND PHARMACOGNOSY

The floor area of this laboratory is 1,224 square feet. It is a long room, with all the work tables placed against the eight large windows on one side of the room. The light is of the kind most suitable for microscopical work.

The department is well supplied with colored charts and plates, an ample stock of drugs, and all requisite apparatus such as section cutters and camera lucida.

The compound microscopes furnished to all students for the work in this laboratory are of Leitz's make, each supplied with one-inch and one-quarter-inch objectives, two eye-pieces, double nose-pieces, and other accessories.

Every student has fifty periods of instruction in this room, each of two hours' length, in each school year of the course for the degree of Graduate in Pharmacy, and students registered for the degree of Pharmaceutical Chemist receive forty-two hours' additional work in commercial microscopy.

THE DISPENSING LABORATORY

This laboratory is a room with a floor area of 1,450 square feet, with accommodations for over a hundred students divided into sections. From twenty to thirty students are assigned to each section.

The School of Pharmacy of Northwestern University was the first to introduce laboratory courses of instruction in the art of dispensing. Twenty-five years' practical experience has demonstrated the value of this course. Systematic training and a sufficient variety of technical work at the dispensing table can no longer be found in the retail drug store. A special dispensing laboratory is, therefore, at this time one of the most important features of the equipment of an efficient training school for pharmacists.

The dispensing laboratory of this School is equipped with an outfit of implements and apparatus many times as extensive as can be found in any drug store. Each student is taught how to use these tools in a workmanlike fashion.

Powders, pills, troches, capsules, tablet triturates, compressed tablets, ointments, plasters, suppositories and a great variety of liquid mixtures, including emulsions, are prepared under the direction of an experienced practical pharmacist.

THE LIBRARY

The School possesses one of the most valuable pharmaceutical reference libraries in this country. It now contains 1,490 bound volumes and 1,460 pamphlets. All the principal current chemical and pharmaceutical journals, foreign and American, are received, and are accessible alike to instructors and students.

The library includes complete sets of Archiv der Pharmazie; the Centralblatt from 1870 and the Berichte der Deutschen Chemischen Gesellschaft from 1868; also, complete from 1893, Zeitschrift für analytische Chemie, Neueste Erfindungen und und Erfahrungen, Berichte der Pharmazeutischen Gesellschaft, Journal of the London Chemical Society, Pharmazeutische Centralhalle, and Repertoire de Pharmacie; complete sets of the British Pharmaceutical Journal, Proceedings of the American Pharmaceutical Association, and the American Journal of Pharmacy.

The library contains also all the pharmacopœias of the world with supplements to date, dispensatories and commentaries on the pharmacopœias, pharmaceutical and chemical encyclopedias and dictionaries, pharmaceutical and other technical formularies, the most valuable reference works and textbooks on chemistry, pharmacy, *materia medica*, and related subjects, and the publications of the American Chemical Society.

THE MUSEUM

The Museum contains more than 2,000 specimens of drugs, chemicals, pharmaceutical preparations, chemical and pharmaceutical apparatus and implements

Authentic specimens of plant drugs, including many of special interest, are here shown, including not only exceptionally fine drugs, but also spurious ones. All plant drugs found in the drug markets are represented by good specimens.

The exhibits of chemical products are exceptionally large, and the exhibits of pharmaceutical products and sick-room supplies are instructive.

Specimens of numerous kinds of chemicals and preparations manufactured by students attest the practical character of the laboratory training.

QUALIFICATIONS FOR ADMISSION

Candidates for the degree of Graduate in Pharmacy must, in accordance with the rule of the American Conference of Pharmaceutical Faculties, present evidence of having completed satisfactorily at least one full year of work in an accredited high school, or its equivalent, and must not be less than seventeen years of age.

Candidates for the degree of Pharmaceutical Chemist must have completed two years' work in a high school of accepted grade, or must possess an equivalent general education.

CREDITS FOR WORK DONE IN OTHER SCHOOLS AND COLLEGES

Students who have satisfactorily completed the first year's work in any other approved college or school of pharmacy, upon presentation of proper evidence to that effect, are admitted to the second year class, provided the work done in each subject is fully equivalent to that of the first year's program of this School and provided that their work conforms to the rule that related subjects must be studied in logical sequence.

Credit is given, subject to the same conditions, for any courses in individual subjects satisfactorily completed elsewhere, so far as these subjects are included in the required studies of this School.

Courses and Degrees

The degrees conferred are those of Graduate in Pharmacy, Pharmaceutical Chemist, Bachelor of Science in Pharmacy, and Master of Pharmacy. A Food and Drugs Course is also offered.

GRADUATE IN PHARMACY (PH.G.)

The course for the degree of Graduate in Pharmacy (Ph.G.) occupies two school years of six months each, when the student devotes his whole time to his studies and laboratory work, or two years of nine months each when he engages in concurrent drug-store employment and, accordingly, carries only two-thirds of the usual weekly program of studies.

PHARMACEUTICAL CHEMIST (PH.C.)

The course for the degree of Pharmaceutical Chemist (Ph.C.) extends through two school years of nine months each, with the student's whole time occupied with his studies and laboratory work. The three years' course for the same degree occupies the student's whole time through three school years of six months each. The program of work is the same as in the two years' course.

A POST GRADUATE COURSE

A post-graduate course is offered to Graduates in Pharmacy of other schools who have had sufficient preparation to complete the prescribed curriculum for the degree of Pharmaceutical

Chemist in one additional year. In this course the work is modified in each case so as to enable the student to take such studies as he has not already pursued.

BACHELOR OF SCIENCE IN PHARMACY

The degree of Bachelor of Science in Pharmacy requires four years of satisfactory work, two years in the College of Liberal Arts and two years in the School of Pharmacy.

REQUIREMENTS FOR GRADUATION

The requirements for graduation include regular attendance, the satisfactory completion of the prescribed program of work, good moral character and satisfactory deportment, and the settlement of all accounts.

Degrees are conferred at the Graduating Exercises held at the conclusion of the Graduate in Pharmacy course in April and at the general University Commencement in June. On these occasions all candidates for degrees are required to be present in person, the Oxford cap and gown being worn as the official dress.

Brief Summary of the Courses of Instruction Courses for the Degree of Graduate in Pharmacy

First Year

A. DEPARTMENT OF THEORY AND PRACTICE OF PHARMACY

Professor Oldberg, Assistant Professor Miner, Mr. Myers and Mr. Oglesby

A1. to A7. Professor Oldberg. Three hours a week.

A1. *Introductory lectures defining pharmacy and stating its functions and problems.*

A2. *The Pharmacopoeia—Its objects, scope and construction.*

A3. *Weights and Measures*—Mass, volume and density. Principles of metrology. The Metric System. Commercial and medicinal weights and measures of America and of Great Britain. Balances and weights. Volume measures. Specific density and specific volume. Instruments and methods employed in the determination of specific gravity.

A4. *Elementary Materia Pharmaceutica*—Preparatory discussion of the various classes of materials employed in the preparation of medicines.

“Crude drugs,” organic and inorganic. Character and mixed composition of plant drugs. Pharmaceutical properties of their constituents, such as cellulose, starch, mucilage, pectin, sugar, albumin, fixed oils and fats, tannin, bitters, volatile oils and related substances, resinous matters, glucosides and other neutral principles, and alkaloids.

A5. *General Pharmaceutical Processes and Manipulations Whereby Medicinal Preparations are Made*. Heat and its practical applications in pharmaceutical operations. Heating apparatus and appliances. Mechanical division of drugs; cutting, crushing, grinding, contusion, trituration, sifting. Finess of powders. Solution, filtration, evaporation, crystallization, precipitation. Sublimation and distillation. Maceration, digestion and percolation. Other methods. Apparatus used.

A6. *Galenical Pharmaceutical Preparations*—General description of the several classes of pharmaceutical products. Stock preparations and extempore preparations. Species, powders, confections, troches, masses, pills. Cataplasms, ointments, cerates, plasters, suppositories. Liquid mixture, including emulsions. Solutions, waters, mucilages, syrups, glycerites. Alcoholic solutions. Infusions, decoctions, tinctures, wines, vinegars, fluid extracts and other liquid extracts. Solid extracts, oleoresins and precipitated resins. Other preparations.

A7. *Pharmaceutical Nomenclature* Systematic and non-systematic names of drugs, chemicals and preparations. Value of latinized or latinic technical titles and their non-latinic equivalents. Principles of construction. Pronunciation and proper abbreviations.

A8. Assistant Professor Miner. Two periods a week of three hours each.

Pharmaceutical Laboratory Practice—Work designed to familiarize the student with apparatus, processes and materials, and to apply the lessons taught in the didactic courses. This course in pharmaceutical and chemical operations includes the manufacture of a great variety of finished preparations. The work is done in the General Pharmaceutical or Manufacturing Laboratory and constitutes the first part of the practical training in operative pharmacy. The students are permitted to take away with them at the end of the year the preparations they make.

A9. Mr. Myers. Two hours a week in the class room together with additional assigned text-book lessons.

Pharmaceutical Arithmetic—Instruction and practice in the solution of the every-day mathematical problems of pharmacy. These problems include weights and measures, doses, proportion, percentage, dilution and fortification and other examples in the computation and adjustment of strength of drugs and preparations, specific gravity and specific volume.

B. DEPARTMENT OF CHEMISTRY

Professor Gordin and Mr. Myers

B1. Professor Gordin. Three hours a week.

General and Inorganic Chemistry, theoretical and descriptive. The principles of the science. The chemical elements and their more important compounds. A course designed to lay the foundation necessary to the successful pursuit of the further work in this department.

B2 and B3. *Laboratory Work*—Professor Gordin and Mr. Myers. Three laboratory periods of three hours each and one recitation hour each week.

B2. *Experimental Study* of the physical and chemical properties of the elements of greatest importance in the elucidation of chemical phenomena and the products of chemical action.

B3. *Qualitative Analysis*—Practical study of the methods of separation and identification of the principal bases and acids and of the reactions involved therein.

Analysis of inorganic substances and mixtures, the composition of which is unknown to the student.

Study of the reagents and methods employed in the application of the identity and purity tests of the Pharmacopœia.

C. DEPARTMENT OF PHARMACEUTICAL BOTANY, MICROSCOPY AND PHARMACOGNOSY

C1. Professor Jensen. One lecture hour and two laboratory periods of two hours each, a week.

The Optical Properties of Mirrors and Lenses and the Mechanism and Manipulation of the Microscope—The organs, tissues and microscopical structure of plants and plant drugs. Cell contents and their recognition. This course constitutes the necessary preparation for the practical study of vegetable drugs. (Course C2, page 17.)

D. HUMAN ANATOMY AND PHYSIOLOGY

Assistant Professor Kahn. Lectures one hour each week. A course designed to give the student such a knowledge of the human body and its organs and functions as will enable him to understand in a general way the processes of nutrition, circulation, respiration, and the mode of action of drugs.

Second Year

A. DEPARTMENT OF THEORY AND PRACTICE OF PHARMACY

Professor Oldberg, Assistant Professor Miner, Assistant Professor Patterson, Mr. Myers and Mr. Fischnar

A10 to A13. Professor Oldberg. Three hours a week.

A10. *The Individual Galenical Prepartions of Organic Drugs*—Their pharmacy and its relation to their chemical constituents. The important preparations of the Pharmacopeia and the National Formulary are fully discussed in this course.

A11. *The Inorganic Chemical Preparations*—Applied inorganic pharmaceutical chemistry. General principles governing the manufacture of chemicals, especially such as may be successfully and profitably made by practicing pharmacists without any other apparatus than that which is necessarily included in the outfit of every properly equipped pharmacy.

The organic pharmaceutical chemicals and their pharmacy also receive due attention in this course.

A12. *Extempore Operative Pharmacy—Extempore Preparations* of the pharmacopoeias and formularies. How they are made.

Physicians' prescriptions and their construction and interpretation. The dispensing department and the art of dispensing. General and special rules. Incompatibilities.

The text used consists of a collection of thousands of formulas and prescriptions, exceptional as well as typical, showing the greatest variety of construction, phases of manipulation, ingredients, and difficulties requiring special treatment. These examples in extempore operative pharmacy have been compiled expressly for the purpose of placing before the students a more extensive and instructive variety of problems than will be found in the prescription files during many years of active work in the busiest of representative drug stores. The collection is in book form, so that teacher and students can analyze and discuss the examples together in order to cultivate and test the student's ability

to decide upon the best way to meet each problem, and to detect errors and incompatibilities.

A13. *The Duties and Responsibilities of Pharmacists and Their Agents.* Pharmacy laws. The relation of pharmacists to the medical profession and the public. Pharmaceutical ethics.

A14. Assistant Professor Miner. Thirty-six laboratory periods of three hours each.

Senior Laboratory Course in the manufacture of pharmaceutical preparations, galenical and chemical, organic and inorganic, official and unofficial.

The extraction and purification of important natural constituents of plant drugs.

Each student makes a large variety of finished products, including important and commonly used preparations of the Pharmacopoeia and the National Formulary, especially those which can and should be made by the practicing pharmacist.

Special care is taken to prepare the student to do successfully and well the work which pharmacists are now called upon to do as the result of the active propaganda in favor of the use of U. S. P. and N. F. preparations in preference to proprietary products. Among the inorganic chemical preparations made are mercury compounds, bismuth compounds, granular effervescent salts, and many iron compounds including scale-salts. Among the organic substances made are aloin, salicin, amygdalin, piperin, salicylic acid, oil of cloves and natural benzoic acid. Each student is permitted to keep samples of the preparations he makes.

Hundreds of products made by the students are shown in special exhibits at the school.

A15. Mr. Fischnar. Two laboratory periods a week of two hours each in the Dispensing Laboratory, and a course of six special lectures on sick-room supplies and "druggists' sundries."

The Laboratory Course in Dispensing is of the utmost importance in the practical training of pharmacists.

The service at the dispensing table comprises the crowning functions of the pharmacist. It is most effectively taught in a special laboratory equipped with all the facilities, apparatus and variety of materials at the command of a competent teacher, who has had ample experience in the practice of pharmacy.

The Special Lectures include instruction in regard to the miscellaneous medicinal and pharmaceutical preparations and sick-room requisites supplied by all well-equipped retail drug stores. These articles include such things as are not made by pharmacists themselves as, for instance, troches, coated pills, filled gelatin capsules and other like ready-made pharmaceutical products; infant foods and other dietetic supplies; sanitary and surgical prep-

arations, appliances and dressings; rubber goods, atomizers, sick-room apparatus and glassware, and the various other articles necessarily furnished by the pharmacist. How such supplies are best kept in good condition. These articles are exhibited to the class.

A16. Mr. Myers. One hour a week in the class-room together with additional assigned text-book lessons.

Pharmaceutical Chemical Problems—Exercises in writing equations and in solving problems relating to applied pharmaceutical chemistry.

B. DEPARTMENT OF CHEMISTRY

Professor Gordin, Assistant Professor Patterson and Mr. Myers.

B4. Professor Gordin. Three hours a week.

Organic Chemistry—The principles of the chemistry of the combustible carbon compounds. Their structure, classification and methods of production. Organic substances important to pharmacy, including the so-called "synthetics," are given special attention.

This course fits the student to pursue intelligently the courses in organic pharmaceutical testing, drug assaying, the production of organic chemical preparations and other practical laboratory work, and to understand fully the text of the pharmacopoeia descriptive of the organic chemicals, alkaloids, volatile oils, etc.

B5. Assistant Professor Patterson. Thirty-six laboratory periods of three hours each.

Volumetric Analysis and Pharmaceutical Testing—Principles and methods. Practice in the preparation and use of standard volumetric test solutions. Alkalimetry and acidimetry and other volumetric analytical processes. Indicators and their uses.

Practice in the application of the purity tests prescribed in the Pharmacopoeia, and in the volumetric quantitative examination of important chemical preparations by the official methods; also the determination of alcohol in tinctures, fluid extracts and other alcoholic liquids; the valuation of pepsin, etc.

The assaying and standardization of opium and its preparations is introduced at the end of this course.

C. DEPARTMENT OF BOTANY, MICROSCOPY AND PHARMACOGNOSY

Professor Jensen. Two laboratory periods a week of two hours each.

C2. *Pharmacognosy*—Study of the organic crude drugs. The most important drugs are thoroughly studied with the aid of the microscope. This course is designed to develop a capacity to interpret and apply the pharmacopœial descriptions for the identification of individual drugs and to form a correct judgment of their quality.

Good specimens of about two hundred of the most important plant drugs are furnished to each student for this work.

E. MATERIA MEDICA AND THERAPEUTICS

Assistant Professor Kahn. Two lectures a week

The properties, action, uses and doses of drugs and medicines, including so much of therapeutics and toxicology as is indispensable to the intelligent and safe practice of pharmacy. Instruction is also given in relation to "first aid to the injured" and other emergency aid which pharmacists may properly render.

The course of *Urine Analysis* (Course B8) is also offered to students registered as candidates for the degree of Graduate in Pharmacy. The fee for this course when taken separately is fifteen dollars. It is given without additional cost in the course for the degree of Pharmaceutical Chemist.

Courses for the Degree of Pharmaceutical Chemist

All the courses for the degree of Graduate in Pharmacy as described in the foregoing pages constitute parts of the curriculum for the degree of Pharmaceutical Chemist. In addition, the following courses are required.

First Year

A. DEPARTMENT OF PHARMACY

Professor Oldberg. One lecture a week through about six weeks.

A17. *Special Course on Miscellaneous Products* not treated of elsewhere, which are made or supplied by pharmacists, including sanitary and hygienic preparations, etc.

B. DEPARTMENT OF CHEMISTRY

B6. Professor Gordin and Mr. Myers. Forty-five laboratory periods of three hours each, supplemented by one weekly recitation.

Gravimetric Analysis—Fundamental operations characteristic of general methods and special processes employed in the gravimetric determination of inorganic substances, including advanced modern methods and the application of this work to pharmaceutical and commercial requirements.

Pharmaceutical Testing (Course B5), as described among the second year courses in chemistry for the degree of Graduate in Pharmacy, is taken by students registered in the course for the degree of Pharmaceutical Chemist in the latter part of the first year. Thirty-six laboratory periods of three hours each.

Second Year

A. DEPARTMENT OF PHARMACY

A18. Professor Oldberg. Six special lectures.

The Principal Pharmacopoeias of the World—The general lessons taught by a comparison of the scope, style of construction, *materia pharmaceutica*, nomenclature, preparations, general directions and other important features of foreign pharmacopœias and formularies with those of the United States.

A19. Assistant Professor Miner. Twenty-eight laboratory periods of three hours each.

Organic Chemical Preparations—The production of organic chemical compounds of pharmaceutical importance or illustrating general methods. Among the substances made by the students are ether, chloroform, iodoform, several organic acids, halogen derivatives of hydrocarbons, nitro benzene, aniline, urea, acetanilide, dithymol, di-iodide, artificial oil of wintergreen, ethyl nitrite, ethyl acetate and various others esters.

B. DEPARTMENT OF CHEMISTRY

B7. Professor Gordin. About fourteen special lectures on *Important Chemical Constituents of Plant Drugs*, such as alkaloids and glucosides, and upon certain important practical applications of *Chemical Physics*, including the use of the polariscope and other instruments in chemical work.

B8. Assistant Professor Patterson. Twenty-four laboratory periods of three hours each.

Urine Analysis, qualitative and quantitative. The detection or determination of constituents of urine which are of importance in the diagnosis of disease.

B9. Assistant Professor Patterson. Forty laboratory periods of three hours each.

Advanced Course in Pharmaceutical Testing and Drug Assaying—A study of the principles and methods employed in the assay of drugs and preparations containing alkaloids, illustrated by laboratory practice in the assays of cinchona, extract of nux vomica, belladonna, aconite, guarana, etc. The examination of volatile oils, including the determination of important constituents, such as phenols, aldehydes, alcohols and esters. Practice in the determination of melting points and boiling points. Other quantitative determinations, such as the assay of spirit of nitrous ether and phenol. The valuation of pepsin, pancreatin and diastase preparations.

B10. Assistant Professor Patterson. Forty laboratory periods of three hours each.

Food and Sanitary Analysis—The examination of water to determine its potability and fitness for household use. The examination of milk, butter, baking powders and food products generally. This course includes laboratory practice in the determination of nitrogen by the Kjeldahl method and its modifications, the determination of the iodine absorption value, saponification value, etc. The detection of food preservatives, such as boric acid and borax, sodium benzoate and formaldehyde. Practice in the methods employed for determining specific gravity.

Physical examinations requiring the use of the polariscope, Zeiss Butyrorefractometer and Babcock milk tester are made.

C. DEPARTMENT OF BOTANY, MICROSCOPY AND PHARMACOGNOSY

Professor Jensen. Twenty-one laboratory periods of two hours each.

C3. *Commercial Microscopy*—A course designed to train the student for the duties of the pharmaceutical chemist and public microscopist in the examination of powdered drugs, spices and food products. Comparisons of pure and adulterated products.

The course includes work with the camera lucida and polariscope.

H. BACTERIOLOGY

Assistant Professor Willard—Thirty-nine laboratory periods of three hours each, through thirteen weeks.

Bacteria in health and disease. Preparation of culture media. Culture methods and methods of staining. The work usually required for sanitary purposes.

Program of Special Course for Food and Drugs Chemists and Inspectors

This program occupies six months, from September to April. It is open to graduates who have had the necessary preliminary courses in chemistry and other branches, embracing not less than twelve hundred hours' instruction and practical work in pharmacy, chemistry and *materia medica*.

The courses included in the program, subject to such modifications as may be called for by the students' preliminary work, are: A17, A18, A19, B6, B7, B9, B10 and C3, together with either B8 or Course H.

General Statements

OCCUPATIONS OPEN TO GRADUATES

Applications made to this School for graduates to fill desirable positions have, for many years, exceeded the supply. As a rule, graduates secure positions in advance of leaving the School.

The occupations open to graduates include the drug business, wholesale and retail; modern professional pharmacy; positions as pharmacists in the Army, Navy, and the Public Health and Marine Hospital Service; as hospital pharmacists; work under the national, state and municipal governments in connection with the enforcement of the food and drugs laws; and employment in manufacturing and wholesale establishments in connection with the production and examination of foodstuffs and medicines.

A result of the enactment of the Food and Drug laws is the increased demand for educated men in the establishments which manufacture or handle goods coming under legal supervision, and this demand seems likely to become greater year by year. Systematic training is necessary for those who undertake this work.

CONFERENCE OF PHARMACEUTICAL FACULTIES

The American Conference of Pharmaceutical Faculties is a national association of the faculties of pharmaceutical schools which have mutually agreed to maintain certain definite educational standards. The School of Pharmacy of Northwestern University is a member.

All members of the Conference receive equal recognition under the pharmacy laws of those states in which actual special education for pharmacy is required or given any credit. In many of the states, however, actual systematic education for pharmacy is neither required nor given consideration; all that is necessary

in those states is the passing of the State Board examination. Graduates of well equipped and rightly conducted pharmaceutical schools pass any proper examination. But in the states of Alabama, Arkansas, Delaware, Missouri and West Virginia the Boards of Pharmacy are required by the laws to license without examination all persons who may be graduates of those colleges of pharmacy which include a certain amount of drug store service among their graduation requirements.

FEES AND EXPENSES

Matriculation Fee, paid on first registration:

Not returnable \$ 5.00

Tuition Fees:

For the course leading to the degree of Graduate in Pharmacy, payable \$50 September 27, \$50 January 3 100.00

For the course leading to the degree of Pharmaceutical Chemist, payable \$50 September 27, \$50 January 3, \$40 April 8 140.00

Breakage deposit, covering wear and tear of equipment, estimated at \$3.00 a year, and the breakage of apparatus, the balance being refunded at the end of the year 10.00

Coupon Ticket, for the purchase of certain indispensable articles that render the work effective and orderly (not materials consumed). These articles include note books, drawing books, aprons and sleeves, additional pieces of apparatus required to replace those broken or lost 5.00

Graduation fee 10.00

The cost of materials consumed in the laboratories is included in the tuition fees.

The cost of the text-books required in the junior year is \$16.00; senior year, \$8.00.

EXPENSE OF BOARD AND ROOM

Within walking distance of the School is a quiet residence portion of the city near Lake Michigan. In this section room and board together may be obtained at from \$4.50 to \$6.00 per week. A less expensive way to live, however, is for two or several students to rent rooms together, either single or *en suite*, and take their meals in one of the many excellent restaurants with which the city abounds.

Complete information regarding all of these matters may be obtained of the Young Men's Christian Association secretary in

the corridor of Northwestern University building, who also assists students in finding employment.

NOTES

For twenty-five years the needs of students of Pharmacy have been carefully studied by the Faculty of this School. The teaching methods employed are based upon the knowledge thus gained. The welfare of each individual student is a matter of personal interest to every instructor.

All the courses of instruction in this School are given exclusively to students of pharmacy. In these circumstances the teachers are enabled to specialize to the fullest extent, a fact of marked advantage to their students.

In every department of the School, teaching and equipment have constantly kept pace with the pharmaceutical progress.

The School was the first to fit up a separate laboratory wherein students are taught to dispense properly and to master prescription difficulties.

The diplomas of this School command respect everywhere. The demand for its graduates is far greater than the supply.

Only a part of the training necessary for pharmaceutical work can be gained in a drug store.

It is impossible to master any scientific-technical subject without a systematic course of instruction, including laboratory practice in a well conducted school or college. Of pharmacy this is especially true.

EARNING ONE'S WAY

To assist worthy students who are unable to pay their way through school without at the same time taking employment, the administrative office of the School is able to render efficient service. Familiarity with the business conditions in Chicago and large acquaintanceship with the druggists of the city give us unusual opportunities for placing young men in good drug stores at satisfactory remuneration. But store work should not be undertaken unless it is financially unavoidable. The Faculty believes that, in justice to their studies students should, if possible, entirely forego this work during the school term.

Students are often assisted by the Young Men's Christian Association to secure miscellaneous work at odd hours. There is no fee for this assistance.

Requests for information regarding any feature of the School's work should be addressed to Charles W. Patterson, Secretary, Northwestern University Building, Lake and Dearborn Street, Chicago.



IN THE LIBRARY. This is a University School of Pharmacy, and so it is not satisfied to do practical work only. The Library has the best American and foreign journals and books of reference.



THE NORTHWESTERN UNIVERSITY GYMNASIUM AT EVANSTON. Pharmacy students enjoy gymnasium privileges in this splendid new building.



THE LABORATORY BUILDING OF NORTHWESTERN UNIVERSITY MEDICAL SCHOOL, TWENTY-FOURTH AND DEARBORN STREETS, CHICAGO. Many Pharmacy students find their training a large part of the preparation necessary for a Medical course.

OFFICERS OF THE ALUMNI ASSOCIATION

President William Krizan, '96.
Vice-President, John H. Montgomery, '91.
Vice-President, Otto J. Haas, '93.
Vice-President, Leander Eicher, '97.
Treasurer, William H. Harrison, '04.
Secretary, George D. Oglesby, '91.
Trustees—Fred H. Elsner, '99; Ralph H. Smith, '94; Dr. John J. Gill, '93.

All alumni of the School are requested to keep the officers of the Association informed of changes in address. At present many cannot be reached by letters or other communications because their addresses are unknown. Inquiries at the School for such alumni cannot be answered, a fact which not infrequently is a distinct disadvantage to them.

Items of interest to the alumni will be gladly received and frequently published. Send all communications to

George D. Oglesby, *Secretary*,
228 Thirty-first Street, Chicago.

PROSPECTIVE STUDENTS

Prospective students are requested to send their names and addresses with information as to age and general education. Tear off this half page on the dotted line and mail it to the School of Pharmacy of Northwestern University, 87 Lake Street, Chicago.

As a prospective student I desire to be placed on the mailing list of the School of Pharmacy to receive circulars and other information.

My age is.....

General education

I intend taking the course for the degree of.....

Remarks

Signed

Address

Graduates of 1910

DEGREE OF PHARMACEUTICAL CHEMIST

Ammermann, Walter Emil.....	Iron River, Mich.	O'Brian, Lewis Etienne.....	Valparaiso, Ind.
Devlin, Edward	Chicago	O'Rourke, James Patrick.....	Peoria
Carr, William Larrabee	Chicago	Orr, Robert James.....	Quincy
Harris, Herbert Wilson.....	Chicago	Pickard, Joseph Dwight.....	Chicago
Jacobson, Raphael	Chicago	Russell, Adelbert Willis.....	Sussex, Wis.
Kaplan, Jay	Chicago	Shaver, Charles Darwin.....	Ontario, Canada
Knochel, Joseph Martin	Lincoln	Sprague, Arthur Angel.....	Carson City, Mich.
Lee, Chris Wilbur.....	Jackson, Minn.	Winkley, George Ray.....	Chicago
McKelvey, Charles David.....	East Chicago, Ind.		
Morrison, Earl Orin.....	Chicago		

DEGREE OF GRADUATE IN PHARMACY

Abbott, Elmer Reed.....	Mason City	Lappley, Harry Martin.....	Mazomanie, Wis.
Ammermann, Walter Emil.....	Iron River, Mich.	Lee, Chris Wilbur.....	Jackson, Minn.
Barnette, Earl.....	Holbrook, Neb.	Lehmann, Emil Ernest.....	Chicago
Bellamy, Harley Leroy.....	Holbrook, Neb.	Levitt, John Joseph.....	Cairo
Butler, George Dwight.....	Cambridge, Neb.	Lindemann, Armin Stoy.....	Michigan City, Ind.
Carr, William Larrabee.....	Chicago	McKamy, Frank Edwin.....	Galesburg
Carrick, Walter J.....	Traer, Iowa	McKelvey, Charles David.....	East Chicago, Ind.
Cunningham, James Francis.....	Helena, Ark.	Miller, Edward	Chicago
Devlin, Edward	Chicago	Moran, John Alphonso.....	Pueblo, Colo.
Ekstam, Carl Fred.....	Marathon, Ia.	Morrison, Earl Orin.....	Chicago
Ernst, Joseph Daniel.....	Joliet	Mueller, William John.....	Morgan, Minn.
Folkrod, Cyril Clinton.....	Quincy	Ohlson, Olof Howard.....	Chicago
Foresman, Mott.....	Winterset, Ia.	O'Rourke, James Patrick.....	Peoria
Graf, Joseph Peter.....	Dubuque, Ia.	Orr, Robert James.....	Quincy
Hardin, D. Gratton.....	Utica, Neb.	Pickard, Joseph Dwight.....	Chicago
Harris, Herbert Wilson.....	Chicago	Porter, Carson Hosmer.....	Rockford
Heckman, Irvin J.....	Pasadena, Cal.	Quilling, Fred Albert.....	Menominee, Wis.
Heinen, Johnie Michael.....	Ambia, Ind.	Roth, Martin Arthur.....	Lorain, Ohio
Holabird, Harlow Clay.....	Chicago	Schoen, William Arthur.....	Owatonna, Minn.
Honeyman, James Shephard.....	Emerson, Ia.	Stiles, Thaddeus Cornelius.....	Chicago
Hughes, Earl Carlton.....	York, Neb.	Stubbs, Robert Jackson.....	Chicago
Isham, Herbert Austin.....	Miller, S. D.	Tabenski, Longin Louis.....	Chicago
Isted, Harry Frank.....	Bushnell	Wagener, Herman Eugene.....	Parker, S. D.
Jacobson, Raphael.....	Chicago	Walter, Harry George.....	Leavenworth, Kans.
Kadlec, Edwin L.....	Chicago	Warner, Benjamin Greeley.....	Claude, Tex.
Kaplan, Jay	Chicago	Witter, Clarence Porter.....	Maple Park
Keeley, Frank Martin.....	Pontiac	Wyszynski, Walter	Chicago
Kingsley, Wilbur Lloyd.....	Cambridge Springs, Pa.	Youngren, Emil W.....	Chicago
Knochel, Joseph Martin.....	Lincoln	Zimmer, Arthur Philip.....	Monmouth
Krafft, Walter Anthony.....	Lake Forest		
Lapjansky, Michael Anthony	Toluca		

Register of Students 1910-1911

CANDIDATES FOR DEGREE

Second Year

Adams, William Charles.....	Chicago	Brown, Vivus William.....	Chippewa Falls, Wis.
Anderson, Charles Clyde.....	Geneseo	Buck, Roy Elmer.....	Genoa
Andre, Lee Henry.....	Mechanicsville	Bull, George Emanuel.....	Chicago
Babbitt, Harve Clare.....	Neb.	Cady, Leo Melville.....	Grand Junction, Colo.
Baxter, David	Montague, Mich.	Campbell, Lloyd Bruce.....	New Plymouth, Idaho
Bergman, Willard Louis.....	Chicago		
Boarini, Edward Vincent.....	Chicago		

*Carlson, J. Leland.....Ogden, Utah	Kramer, Lee Edward.....Morrison
Cook, Jay J..Iron Mountain, Mich.	Little, Raymond Robert.....Leon, Iowa
Coughlan, Robert Emmett..Chicago	McCann, Edward Brice.....Chicago
Daudelin, Eugene Felix...Chicago	Mackh, Carl August.....Elgin
Derebey, Harold Pericles..Chicago	Miller, Henry Farris...Olin, Iowa
Dickey, James Harvey.....Iroquois, So. Dak.	Musser, William Seegmiller.....Salt Lake City, Utah
Donaldson, Robert Walter....Polo	Nesbit, Graham William.....Ogden, Utah
Donlchy, Harry	Newmann, Maurice Mayer..Chicago
Donnell, Madison Clayton.....El Paso, Tex.	Nolting, Walter Otto.....Freeport
†Duffy, Mark Matthew.....Brandon, Wis.	Nolan, Mary Cecilia.....Chicago
Eftaxopoulos, Constantine So-tirion.....Chicago	Noyes, Wynne Charles.....Pleasanton, Neb.
Eppelsheimer, Samuel.....Griswold, Iowa	Painter, Clinton Blair.....Chicago
Gimbel, Charles Leo.....Davenport, Iowa	Park, Edward Louis.....Chicago
Hallowell, John Phillip.....Odessa, Neb.	Parker, Clarence William.....Lisbon, No. Dak.
Hanson, Selmer...Canton, So. Dak.	Puley, Walter Leon.....Marion
Heffernan, Thomas Francis.Chicago	Rains, Ernest K.....Chicago
Hendrickson, Alfred.....Bismarck, No. Dak.	Renneckar, Carl Clayton..Wilmette
Henwood, Maxwell Butler.....Prophetstown	Schaettgen, Arnold Fred.....Dubuque, Iowa
Hill, Fred Leroy.....Kewanee	Schoen, Leslie A.....Victor, Colo.
Hillebrecht, Herbert E.....Columbia, So. Car.	Sebbes, Fred John.....Chicago
Hoaglund, Clifford Paul.....Ottumwa, Iowa	Stewart, Roy Page.....Chicago
*Hochschild, Tony Edwin.....Horicon, Wis.	Stoll, Walter Oliver.....Joliet
Johanson, Oscar H.....Chicago	Stoltz, Charles Benton.....Casey
Johnson, Bert Napoleon..Batavia	Strassburger, Ernest.....Chicago
Johnson, Melvin Lloyd.....Laramie, Wyo.	Summers, Roland McCord.....Indiana Harbor, Ind.
Kaufmann, Edward Samuel.....Youngstown, O.	Tanner, Winfred Erle..Lewistown
Kelley, John Francis....Highwood	Vurpillat, Joseph Bede.....Winnemac, Ind.
Kimbel, Edward....Hammond, Ind.	Wade, James William.....Fairbury
Kohlmann, Albert James.....Dubuque, Iowa	Weech, Robert Walter.....Elgin, Oregon
‡Bicknell, Arthur James.....Livingston, Mont.	†Worthington, Clyde Leonard.....Meridian, Miss.
Bengston, John Albert.....Chicago	Zieske, Arthur Aaron.....Watertown, So. Dak.
Berlin, Frank John..Salida, Colo.	Zwack, John
Biagi, Edward Cellestine.....Dubuque, Iowa	Chicago
†Bicknell, Arthur James.....Gosport, Ind.	
Bowers, Thomas Alfred.Salida, Col.	
Brannon, Herbert Harrison.....Circleville, Ohio	
Bridges, Thomas Grover.....Paragould, Ark.	
Bryant, Austin Siler...Pratt, Kans.	Collins, Stanley Herbert...Chicago
Brzak, Emanuel John.....Chicago	Cook, Lvell Fay.....Morrison
†Butler, William Edgar.....Bainbridge, Ga.	Corrie, Bennie
Byrd, Lewis Herschel..Carbondale	Cowan, Archibald.....Milford
Campbell, William	†Current, Fred Floyd.....Indianola
Cappetta, Vincent Carmen..Chicago	Davis, James Duncan..Salida, Colo.
Carlson, Gunnar Emanuel..Moline	Day, Walter Jackson.....Pecatonica
Carr, Damon Hayes...Bloomington	Drum, Leland Edward.....Stryker
Carroll, Nova B...Cambridge, Neb.	Dunlap, Leland Harold.....Knoxville, Iowa
Chandler, Elliott Talcott..Compton	Estes, Edward Reuben.....Henderson, Minn.
Coleman, Coral Cornelius...Canton	Etnyre, Lee Ernest.....Oregon
	Felger, Frank Fred..Norfolk, Neb.
	Fieselmann, Sidney Frederick.....Peoria
	Finney, David Bertrie...Petersburg
	Frantz, Henry Erle.Winthrop, Iowa
	Frizzell, Lewis, Jr.....Vienna
	Frock, Lisle Price.....Colorado Springs, Colo.
	Garver, Clarence Earl.....Bremen, Ind.
	Gordon, Leslie Albert.....Havana
	Groome, Percy Samuel.....Yankton, So. Dak.
	Hatch, Arthur Clarkson.....Creston, Iowa

First Year

Ackermann, William Herman..Elgin	
Ahl, Herbert Clarence.....Moline	
Bairnson, George Andrew..Chicago	
†Beiley, Fred William.....Livingston, Mont.	
Bengston, John Albert.....Chicago	
Berlin, Frank John..Salida, Colo.	
Biagi, Edward Cellestine.....Dubuque, Iowa	
†Bicknell, Arthur James.....Gosport, Ind.	
Bowers, Thomas Alfred.Salida, Col.	
Brannon, Herbert Harrison.....Circleville, Ohio	
Bridges, Thomas Grover.....Paragould, Ark.	
Bryant, Austin Siler...Pratt, Kans.	
Brzak, Emanuel John.....Chicago	
†Butler, William Edgar.....Bainbridge, Ga.	
Byrd, Lewis Herschel..Carbondale	
Campbell, William	
Cappetta, Vincent Carmen..Chicago	
Carlson, Gunnar Emanuel..Moline	
Carr, Damon Hayes...Bloomington	
Carroll, Nova B...Cambridge, Neb.	
Chandler, Elliott Talcott..Compton	
Coleman, Coral Cornelius...Canton	

Held, Ernest Alfred.....	Clay Center, Kans.	O'Daniel, Ellis John.....	Chicago
†Hoelzel, Vincent	Chicago	Owen, Gay	Carthage
Huber, Otto Anthony.....	Newton	Palmer, Hilding F.....	Morrison
Huber, Paul Robert.....	Chicago	†Palumbo, Michael Archangel.....	Chicago
Irvine, Lionell Elmore.....	Chicago	Pettersen, Holger	Chicago
Johnson, John Elmer.....	Chicago	Potter, James Zadock Piggott, Ark.	
Jones, Durmand....La Crosse, Ind.		Puckel, Joseph Roy.....	Rockford
Jordan, Thomas Gilbert.....	Barton, Wis.	Pulley, Guy Lincoln.....	Marion
Kennelley, Elmer J.....	Chicago	Quirk, Irwin Leo.....	Dyersville, Iowa
†Koch, Lawrence.....	La Porte, Ind.	†Rankin, Nellie.....	Oil City, Penn.
Laval, Carl Floyd.....	Evansville, Ind.	Reich, Albert Emil.....	Mazomanie, Wis.
McClean, Albert Joseph.....	Farley, Iowa	Reihansperger, Charles John.....	West Chicago
McDonald, James Henry, Jr.....	Chicago	Rothe, William George.....	Crawford
MacCoy, George James...Oak Park		Schaller, Frank William.....	Yankton, So. Dak.
Maggid, Nathan	Chicago	Schulze, Herman Anthony.....	Ossian, Iowa
Mars, Hartley Farnham.....	Newport, Minn.	Sieber, John Andrew.....	Evanston
Mauk, Guy	Martinsville	Siedenfuss, John	Rock Island
†Melgaard, Goldie Annetta.....	Volin, So. Dak.	Sinclair, Scott	Woodstock
Miller, Joseph Benjamin....Clayton		Sorlin, Oswald	Chicago
Moffatt, Brice Pressly..Troy, Tenn.		Stadelmann, Oscar Lenz	Mazomanie, Wis.
Nandedkar, Mahader Abaje.....	Mhow, Central India	Stinger, Arthur Charley.....	Cresco, Iowa
Nash, Will Wells.....	Ripon, Wis.	Stone, Rosco.....	Portageville, Mo.
Needham, Francis Joseph.....	Victor, Colo.	Stroh, Grover Rehrmes.....	Oregon
Nussie, Eugene Otto.....	Granville	Torrey, Frank Aldis.....	Alba, Mich.
Nix, Leroy Anthony.....	Chicago	Turner, Hugh Arnold.....	Faulkton, So. Dak.
		Wunsch, James K.....	Chicago
		Zobel, Charles Frederic.....	Chicago

Special Students

Coen, John	Chicago	Lyzwek, Joseph Raymonds..Chicago
†Corson, George	Chicago	Mahler, William Hermann.....
Elkmeyer, Frank Henry.....	Ft. Madison, Iowa	Elmhurst
Ensign, Horace	Chicago	Murawski, Alex. Frank.....Chicago
†Forbrich, Charles Anthony. Antioch		Neufeld, John
Forsell, Evar Carl.....	Rockford	Davenport, Iowa
Goldman Ada Mazuska....Chicago		O'Shea, Nora
Hendricksen, Waldemar Harold	Sioux City, Iowa	South Bend, Ind.
Hiatt, Jesse Levi....Vernal, Utah		Schnebelin, Harry Peter.....
Hodapp, Michael Ehrhast.....		Peoria
Joyce, John Thomas..West Chicago		†Shenowsky, Morris
†Jungknecht, Edward Robert.Chicago		Chicago
†Krizan, John	Chicago	Swenson, Harold Lawrence.....
†Lipsietz, Eli	Chicago	Ottumwa, Iowa

*Deceased.

†Did not attend.

‡Withdrew.



Northwestern University

¶ THE COLLEGE OF LIBERAL ARTS, located at Evanston, in an ideal college community, offers special preparation for the professions, and for pursuits requiring broad training.

¶ THE MEDICAL SCHOOL is one of the oldest, largest, and best equipped. Seven hospitals are open to students. Clinic material is abundant.

¶ THE LAW SCHOOL, the oldest law school in Chicago, offers unexcelled library facilities and special courses that prepare for immediate practice in any state upon graduation.

¶ THE COLLEGE OF ENGINEERING has its own building just completed, beautifully situated, a model of efficiency. Offers courses in all branches of Engineering. Technical studies in a University environment.

¶ THE SCHOOL OF PHARMACY offers a scientific training in Pharmacy, Chemistry, and Drug and Food Analysis. Special courses for Drug Clerks.

¶ THE DENTAL SCHOOL offers expert training in theory and practice. Facilities are unsurpassed. Its clinic is the largest in the world.

¶ THE SCHOOL OF MUSIC affords a scientific preparation for music as an accomplishment and a profession. It is located at Evanston.

¶ THE SCHOOL OF COMMERCE provides instruction in economics, elementary and corporation finance, commercial law and accounting. Many lecturers from business and professional life.

¶ EVANSTON ACADEMY prepares for college, for engineering, for professional schools, and for business.

For information regarding any school of the University address President A. W. Harris, Northwestern University Building, Chicago.

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April 13, 1911

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NORTHWESTERN UNIVERSITY

EVANSTON and CHICAGO

UNIVERSITY OF ILLINOIS
SCHOOL OF PHARMACY
PRESIDENT'S OFFICE

GENERAL CATALOGUE
OF THE
SCHOOL OF PHARMACY
1912-1913



NORTHWESTERN UNIVERSITY BUILDING
LAKE AND DEARBORN STREETS, CHICAGO

NORTHWESTERN
UNIVERSITY
EVANSTON and CHICAGO

UNIVERSITY OF ILLINOIS

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GENERAL CATALOGUE
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SCHOOL OF PHARMACY
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Published by the University
April, 1912

The School of Pharmacy
Calendar
1912-1913

1912

- Jan. 3 Wed. Instruction resumed
Feb. 22 Thu. Washington's Birthday
Apr. 1 Mon. Examinations begin, Graduate in Pharmacy Course
Apr. 1 Mon. Recess, to Sunday, April 7, inclusive, Pharmaceutical Chemist Course
Apr. 9 Tue. Graduating exercises, Graduate in Pharmacy Course and three-year Pharmaceutical Chemist Course
May 30 Thu. Memorial Day
June 6 Thu. Senior examinations begin, Pharmaceutical Chemist Course
June 12 Wed. FIFTY-FOURTH ANNUAL COMMENCEMENT

1912-1913

1912

- Sept. 23 Mon. First day of registration
Sept. 25 Wed. Lectures and class work begin
Nov. 28 Thu. Thanksgiving Recess, to Sunday, December 1, inclusive
Dec. 23 Mon. Christmas Recess, to Sunday, January 5, inclusive

1913

- Jan. 6 Mon. Instruction resumed
Feb. 12 Wed. Lincoln's Birthday
Feb. 22 Sat. Washington's Birthday
Mar. 31 Mon. Examinations begin, Graduate in Pharmacy Course
Mar. 31 Mon. Recess to Sunday, April 6, inclusive, Pharmaceutical Chemist Course
Apr. 9 Wed. Graduating exercises, Graduate in Pharmacy Course and three-year Pharmaceutical Chemist Course
May 30 Fri. Memorial Day
June 2 Mon. Senior examinations begin, Pharmaceutical Chemist Course
June 11 Wed. FIFTY-FIFTH ANNUAL COMMENCEMENT

The School of Pharmacy

THIS school, incorporated in 1886 as the Illinois College of Pharmacy became a department of the University the same year. In 1891 the name was changed to the School of Pharmacy of Northwestern University. It is a member of the American Conference of Pharmaceutical Faculties and its graduates are recognized in all states in which graduation from a school of pharmacy is necessary to obtain license to practice.

The School's work is carried on in the University Building, Lake and Dearborn Streets, Chicago. The rooms occupied include six large laboratories, two lecture rooms, a balance room, library, museum, and two rooms for students. The laboratories are: the laboratory for inorganic chemistry, with accommodations for three classes of seventy students each; the laboratory for botany, microscopy, and pharmacognosy, with accommodations for four sections of forty-eight students each; the manufacturing laboratory, with accommodations for four sections of seventy students each; the laboratory for organic chemistry, with accommodations for four sections of twenty-eight students each; and the dispensing laboratory, with accommodations for three sections of thirty-six students each. Courses in bacteriology are given in the bacteriological laboratory on the fifth floor.

All the courses of instruction in the School are given exclusively to students of pharmacy and are adapted to their special needs. Especial attention is given to laboratory practice in the manufacture, testing, and valuation of preparations and in the work of dispensing.

Applications made to this school for alumni to fill desirable positions have, for many years, exceeded the supply. Undergraduate students are also in demand, being wanted for part-time service in Chicago drug stores while pursuing their courses of study.

The occupations open to graduates of efficient pharmaceutical schools include not only the customary practice of modern technical pharmacy, but similar employment in the service of the national, state, and municipal governments.

The course for the degree of Pharmaceutical Chemist comprises preparation of the most thorough kind, both for the practice of pharmacy and for the expert services required of inspectors of food and drugs under the laws, and for similar service in manufacturing and wholesale establishments.

Faculty

Abram Winegardner Harris, Sc.D., LL.D.
President

Oscar Oldberg, Pharm.D., LL.D.
Dean Emeritus

Charles Waggener Patterson, Sc.B., Ph.C.
Acting Dean

William Edward Quine, M.D., LL.D.
Emeritus Professor of Physiology, Therapeutics and Toxicology

Harry Mann Gordin, Ph.D.
Professor of Chemistry and Director of the Chemical Laboratories

Gerhard H. Jensen, Ph.D.
Professor of Botany and Pharmacognosy

Maurice Ashbel Miner, Pharm.M.
Professor of Pharmacy and Director of the Pharmaceutical Laboratories

Charles Waggener Patterson, Sc.B., Ph.C.
Assistant Professor of Analytical Pharmaceutical Chemistry

Harry Kahn, Pharm.M., M.D.
Assistant Professor of Physiology and Materia Medica

Eugene Shaw Willard, D.D.S.
Assistant Professor of Bacteriology

George Daniel Oglesby, Ph.G.
Lecturer in Pharmacy

John Ferdinand Fischnar, Ph.C.
Instructor in the Dispensing Laboratory

James Lewis Clay, Ph.C.
Instructor in the Chemical Laboratories

Jay Kaplan, Ph.C.
Assistant in Chemistry

Edward Park, Ph.G.
Assistant in the Chemical Laboratories

Clifford Paul Hoaglund, Ph.G.
Assistant in the Manufacturing Laboratory

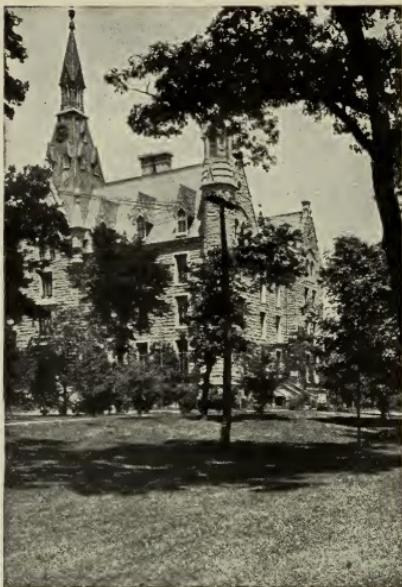
Admission and Instruction

Candidates for the degree of Graduate in Pharmacy must present evidence of having satisfactorily completed one full year of work in a properly accredited high school, or its equivalent, and must be at least seventeen years of age.



Northwestern University Building
Lake and Dearborn Streets, Chicago

Home of the Law School, the School of Pharmacy, the Dental School
and the School of Commerce



University Hall
on the Campus
at Evanston



Laboratory for Microscopy and Pharmacognosy

Candidates for the degree of Pharmaceutical Chemist must have completed two years' work in a high school of accepted grade or must possess an equivalent general education.

Candidates for the degree of Bachelor of Science in Pharmacy must fulfill the requirements for admission to the College of Liberal Arts.

Candidates for the degree of Master of Pharmacy must fulfill the requirements for admission to the College of Liberal Arts.

Special students not candidates for graduation may be admitted by action of the Faculty.

CREDITS FOR WORK DONE IN OTHER SCHOOLS

Students who have satisfactorily completed the first year's work in any approved college or school of pharmacy, upon presentation of proper evidence thereof, are admitted to the second year class, provided the work done in each subject is fully equivalent to that of the first year's program of this School and provided that their work conforms to the rule that related subjects must be studied in logical sequence.

Credit is given, subject to the same conditions, for any courses in individual subjects satisfactorily completed elsewhere, so far as these subjects are included in the required studies of this School.

Courses of Study for the Degree of Graduate in Pharmacy

First Year

A. DEPARTMENT OF PHARMACY

PROFESSOR MINER, ASSISTANT PROFESSOR PATTERSON, MR. OGLESBY,
AND MR. FISCHNAR

A1. *Introductory* lectures defining pharmacy and stating its functions and problems. *The Pharmacopoeia*—Its objects, scope and construction. *Elementary Materia Pharmaceutica*—Preparatory discussion of the various classes of materials employed in the preparation of medicines. “Crude drugs,” organic and inorganic. Character and mixed composition of plant drugs. Pharmaceutical properties of their constituents, such as cellulose, starch, mucilage, pectin, sugar, albumen, fixed oils and fats, tannin, bitters, volatile oils and related substances, resinous matters, glucosides and other neutral principles, and alkaloids. *Pharmaceutical Nomenclature*—Systematic and non-systematic names of drugs, chemicals and preparations. Value of latin-

ized or latinic technical titles and their non-latinic equivalents. Principles of construction. Pronunciation and proper abbreviations. One hour a week. Mr. Oglesby.

A2. *Galenical Pharmaceutical Preparations*—General description of the several classes of pharmaceutical products. Stock preparations and extempore preparations. Species, powders, confections, troches, masses, pills. Cataplasms, ointments, cerates, plasters, suppositories. Liquid mixtures, including emulsions. Solutions, waters, mucilages, syrups, glycerites. Alcoholic solutions. Infusions, decoctions, tinctures, wines, vinegars, fluid extracts and other liquid extracts. Solid extracts, oleoresins and precipitated resins. Other preparations. One hour a week. Mr. Oglesby.

A3. *General Pharmaceutical Processes and Manipulations Whereby Medicinal Preparations are Made*. Heat and its practical applications in pharmaceutical operations. Heating apparatus and appliances. Mechanical division of drugs; cutting, crushing, grinding, contusion, trituration, sifting. Fineness of powders. Solution, filtration, evaporation, crystallization, precipitation. Sublimation and distillation. Maceration, digestion and percolation. Other methods. Apparatus used. One hour a week. Mr. Fischnar.

A4. *Weights and Measures and Pharmaceutical Problems*—Mass, volume and density. Principles of metrology. The Metric System. Commercial and medicinal weights and measures of America and of Great Britain. Balances and weights. Volume measures. Specific density and specific volume. Instruments and methods employed in the determination of specific gravity. Instruction and practice in the solution of the every-day mathematical problems of pharmacy. These problems include weights and measures, doses, proportion, percentage, dilution and fortification and other examples in the computation and adjustment of strength of drugs and preparations, specific gravity and specific volume. Two hours a week. Assistant Professor Patterson.

A5. *Pharmaceutical Laboratory Practice*—Work designed to familiarize the student with apparatus, processes and materials, and to apply the lessons taught in the didactic courses. This course in pharmaceutical and chemical operations includes the manufacture of a great variety of finished preparations. The work is done in the General Pharmaceutical or Manufacturing Laboratory and constitutes the first part of the practical training in operative pharmacy. The students are permitted to take away with them at the end of the year the preparations they make. Two periods a week of three hours each. Professor Miner.

B. DEPARTMENT OF CHEMISTRY**PROFESSOR GORDIN AND MR. CLAY**

B1. *General and Inorganic Chemistry*, theoretical and descriptive. The principles of the science. The chemical elements and their more important compounds. A course designed to lay the foundation necessary to the successful pursuit of the further work in this department. Three hours a week. Professor Gordin.

B2. *Experimental Study* of the physical and chemical properties of the elements of greatest importance in the elucidation of chemical phenomena and the products of chemical action.

B3. *Qualitative Analysis*—Practical study of the methods of separation and identification of the principal bases and acids and of the reactions involved therein.

Analysis of inorganic substances and mixtures, the composition of which is unknown to the student.

Study of the reagents and methods employed in the application of the identity and purity tests of the Pharmacopoeia.

B2 and B3. *Laboratory Work*—Three laboratory periods of three hours each and one recitation hour each week. Professor Gordin and Mr. Clay.

C. DEPARTMENT OF PHARMACEUTICAL BOTANY, MICROSCOPY AND PHARMACOGNOSY**PROFESSOR JENSEN**

C1. *Pharmaceutical Botany*—The organs, tissues and microscopical structure of plants and plant drugs. Cell contents and their recognition. The optical properties of mirrors and lenses and the mechanism and manipulation of the microscope.

Two laboratory periods of two hours each and one lecture hour each week. Professor Jensen.

This course constitutes the necessary preparation for the practical study of vegetable drugs.

D. HUMAN ANATOMY AND PHYSIOLOGY**ASSISTANT PROFESSOR KAHN**

D1. A course designed to give the student such a knowledge of the human body and its organs and functions as will enable him to understand in a general way the processes of nutrition, circulation, respiration, and the mode of action of drugs. One hour a week. Assistant Professor Kahn.

Second Year

A. DEPARTMENT OF THEORY AND PRACTICE OF PHARMACY

PROFESSOR MINER, ASSISTANT PROFESSOR PATTERSON,
MR. OGLESBY, AND MR. FISCHNAR

A6. *The Individual Galenical Preparations of Organic Drugs*—Their pharmacy and its relation to their chemical constituents. The important preparations of the Pharmacopœia and the National Formulary are fully discussed in this course. One hour a week. Assistant Professor Patterson.

A7. *The Inorganic Chemical Preparations*—Applied inorganic pharmaceutical chemistry. General principles governing the manufacture of chemicals, especially such as may be successfully and profitably made by practicing pharmacists without any other apparatus than that which is necessarily included in the outfit of every properly equipped pharmacy. The organic pharmaceutical chemicals and their pharmacy. One hour a week. Professor Miner.

A8. *Extempore Operative Pharmacy—Extempore Preparations* of the pharmacopœias and formularies. How they are made.

Physicians' prescriptions and their construction and interpretation. The dispensing department and the art of dispensing. General and special rules. Incompatibilities.

The text used consists of a collection of thousands of formulas and prescriptions, exceptional as well as typical, showing the greatest variety of construction, phases of manipulation, ingredients, and difficulties requiring special treatment. These examples in extempore operative pharmacy have been compiled expressly for the purpose of placing before the students a more extensive and instructive variety of problems than will be found in the prescription files during many years of active work in the busiest of representative drug stores. The collection is in book form, so that teacher and students can analyze and discuss the examples together in order to cultivate and test the student's ability to decide upon the best way to meet each problem, and to detect errors and incompatibilities.

A9. *The Duties and Responsibilities of Pharmacists and Their Agents*. Pharmacy laws. The relation of pharmacists to the medical profession and to the public. Pharmaceutical ethics.

A8 and A9. One hour a week. Mr. Oglesby.

A10. *Senior Laboratory Course* in the manufacture of pharmaceutical preparations, galenical and chemical, organic and inorganic, official and unofficial.

The extraction and purification of important natural constituents of plant drugs.

Each student makes a large variety of finished products, including important and commonly used preparations of the Pharmacopœia and the National Formulary, especially those which can and should be made by the practicing pharmacist.

Special care is taken to prepare the student to do successfully and well the work which pharmacists are now called upon to do as the result of the active propaganda in favor of the use of U. S. P. and N. F. preparations in preference to proprietary products. Among the inorganic chemical preparations made are mercury compounds, bismuth compounds, granular effervescent salts, and many iron compounds including scale-salts. Among the organic substances made are aloin, salicin, amygdalin, piperin, salicylic acid, oil of cloves and natural benzoic acid. Each student is permitted to keep samples of the preparations he makes.

Hundreds of products made by the students are shown in special exhibits at the school.

Thirty-six laboratory periods of three hours each. Professor Miner.

A11. Laboratory Course in Dispensing—The lessons are systematically prepared or selected with the view to include all important phases of work at the dispensing table with all kinds of materials and by all the different methods practiced. A practical experimental study of incompatibilities is included in this course. Fifty laboratory periods of two hours each. Mr. Fischnar.

A12. Pharmaceutical Chemical Problems—Exercises in writing equations and in solving problems relating to applied pharmaceutical chemistry. One hour each week. Assistant Professor Patterson.

B. DEPARTMENT OF CHEMISTRY

PROFESSOR GORDIN, ASSISTANT PROFESSOR PATTERSON, AND MR. CLAY

B4. Organic Chemistry—The principles of the chemistry of the combustible carbon compounds. Their structure, classification and methods of production. Organic substances important to pharmacy, including the so-called "synthetics," are given special attention.

This course fits the student to pursue intelligently the courses in organic pharmaceutical testing, drug assaying, the production of organic chemical preparations and other practical laboratory work, and to understand fully the text of the pharmacopœia descriptive of the organic chemicals, alkaloids, volatile oils, etc. Three hours a week. Professor Gordin.

B5. *Volumetric Analysis and Pharmaceutical Testing*—Principles and methods. Practice in the preparation and use of standard volumetric test solutions. Alkalimetry and acidimetry and other volumetric analytical processes. Indicators and their uses.

Practice in the application of the purity tests prescribed in the Pharmacopoeia, and in the volumetric quantitative examination of important chemical preparations by the official methods; also the determination of alcohol in tinctures, fluid extracts and other alcoholic liquids.

The assaying and standardization of opium and its preparations is introduced at the end of this course.

Thirty-six laboratory periods of three hours each. Assistant Professor Patterson.

C. DEPARTMENT OF BOTANY, MICROSCOPY AND
PHARMACOGNOSY

PROFESSOR JENSEN

C2. *Pharmacognosy*—Study of the organic crude drugs. The most important drugs are thoroughly studied with the aid of the microscope. This course is designed to develop a capacity to interpret and apply the pharmacopelial descriptions for the identification of individual drugs and to form a correct judgment of their quality.

Good specimens of about two hundred of the most important plant drugs are furnished to each student for this work.

Two laboratory periods a week of two hours each. Professor Jensen.

E. MATERIA MEDICA AND THERAPEUTICS

ASSISTANT PROFESSOR KAHN

E1. *Materia Medica and Therapeutics*—The properties, action, uses and doses of drugs and medicines, including so much of therapeutics and toxicology as is indispensable to the intelligent and safe practice of pharmacy. Instruction is also given in relation to "first aid to the injured" and other emergency aid which pharmacists may properly render. Two hours a week. Assistant Professor Kahn.

Courses for the Degree of Pharmaceutical Chemist

All the courses for the degree of Graduate in Pharmacy as described in the foregoing pages constitute parts of the curriculum for the degree of Pharmaceutical Chemist. In addition, the following courses are required,

First Year

B. DEPARTMENT OF CHEMISTRY

PROFESSOR GORDIN, ASSISTANT PROFESSOR PATTERSON, AND MR. CLAY

B6. *Gravimetric Analysis*—Fundamental operations characteristic of general methods and special processes employed in the gravimetric determination of inorganic substances, including advanced modern methods and the application of this work to pharmaceutical and commercial requirements.

Forty-five laboratory periods of three hours each, supplemented by one weekly recitation. Professor Gordin and Mr. Clay.

Pharmaceutical Testing (Course B5), as described among the second year courses in chemistry for the degree of Graduate in Pharmacy, is taken by students registered in the course for the degree of Pharmaceutical Chemist in the latter part of the first year. Thirty-six laboratory periods of three hours each.

Second Year

A. DEPARTMENT OF PHARMACY

PROFESSOR MINER

A13. *Organic Chemical Preparations*—The production of organic chemical compounds of pharmaceutical importance or illustrating general methods. Among the substances made by the students are ether, chloroform, iodoform, several organic acids, halogen derivatives of hydrocarbons, nitro benzene, aniline, urea, acetanilide, dithymol diiodide, artificial oil of wintergreen, ethyl nitrite, ethyl acetate and various other esters.

Twenty-eight laboratory periods of three hours each. Professor Miner.

B. DEPARTMENT OF CHEMISTRY

PROFESSOR GORDIN AND ASSISTANT PROFESSOR PATTERSON

B7. *Important Chemical Constituents of Plant Drugs*, such as alkaloids and glucosides, and upon certain important practical applications of *Chemical Physics*, including the use of the polariscope and other instruments in chemical work.

Twenty lectures. Professor Gordin.

B8. *Urine Analysis*, qualitative and quantitative. The detection or determination of constituents of urine which are of importance in the diagnosis of disease.

Twenty-four laboratory periods of three hours each. Assistant Professor Patterson.

B9. *Advanced Course in Pharmaceutical Testing and Drug Assaying*—A study of the principles and methods employed in the assay of drugs and preparations containing alkaloids, illustrated by laboratory practice in the assays of cinchona, extract of nux vomica, belladonna, aconite, guarana, etc. The examination of volatile oils, including the determination of important constituents, such as phenols, aldehydes, alcohols and esters. Practice in the determination of melting points and boiling points. Other quantitative determinations, such as the assay of spirit of nitrous ether and phenol. The valuation of pepsin, pancreatin and diastase preparations.

Forty laboratory periods of three hours each. Assistant Professor Patterson.

B10. *Food and Sanitary Analysis*—The examination of water to determine its potability and fitness for household use. The examination of milk, butter, baking powders and food products generally. This course includes laboratory practice in the determination of nitrogen by the Kjeldahl method and its modifications, the determination of the iodine absorption value, saponification value, etc. The detection of food preservatives, such as boric acid and borax, sodium benzoate and formaldehyde. Practice in the methods employed for determining specific gravity.

Physical examinations requiring the use of the polariscope, Zeiss Butyrorefractometer and Babcock milk tester are made.

Forty laboratory periods of three hours each. Assistant Professor Patterson.

C. DEPARTMENT OF BOTANY, MICROSCOPY AND PHARMACOGNOSY

PROFESSOR JENSEN

C3. *Commercial Microscopy*—A course designed to train the student for the duties of the pharmaceutical chemist and public microscopist in the examination of powdered drugs, spices and food products. Comparisons of pure and adulterated products.

The course includes work with the camera lucida and polariscope. Twenty-one laboratory periods of two hours each. Professor Jensen,

ELECTIVE

H. DEPARTMENT OF BACTERIOLOGY

ASSISTANT PROFESSOR WILLARD

H1. *Bacteriology*—Bacteria in health and disease. Preparation of culture media culture methods and methods of staining. The work usually required for sanitary purposes.

Thirty-nine laboratory periods of three hours each. Assistant Professor Willard.

Program of Special Course for Food and Drugs Chemists and Inspectors

This program occupies six months, from September to April. It is open to graduates who have had the necessary preliminary courses in chemistry and other branches, embracing not less than twelve hundred hours' instruction and practical work in pharmacy, chemistry and *materia medica*.

The courses included in the program, subject to such modifications as may be called for by the students' preliminary work, are: A13, B6, B7, B9, B10 and C3, together with either B8 or Course H.

SPECIAL COURSES

Unclassified students are admitted, by action of the Faculty, to any of the individual courses included in the program of work required for a degree, to advanced courses, and to any additional special courses which the School is prepared to offer. The fees for such elective courses are in proportion to their extent, and full credit is given in the form of certificates for work satisfactorily completed.

Degrees

The requirements for graduation include regular attendance, for at least one year in this School, the satisfactory completion of the prescribed program of work, good moral character and satisfactory deportment, and the settlement of all accounts.

Degrees are conferred at the Graduating Exercises held at the conclusion of the Graduate in Pharmacy course in April and at the general University Commencement in June. On these occasions all candidates for degrees are required to be present in person, the Oxford cap and gown being worn as the official dress.

The degrees conferred are those of Graduate in Pharmacy, Phar-

maceutical Chemist, Bachelor of Science in Pharmacy, and Master of Pharmacy.

DEGREE OF GRADUATE IN PHARMACY

The course for this degree occupies two school years of six months each, during which the student devotes his whole time to his studies and laboratory work.

The same course occupies two years of nine months each when the student engages in concurrent drug-store employment and when he, accordingly, carries only two-thirds of the weekly program of studies pursued by students who give their whole time to school work.

DEGREE OF BACHELOR OF SCIENCE IN PHARMACY

This degree requires four years, two years of study in the College of Liberal Arts and two years in the School of Pharmacy.

DEGREE OF MASTER OF PHARMACY

This degree is conferred upon completion of three years of study in the College of Liberal Arts and two years in the School of Pharmacy.

DEGREE OF PHARMACEUTICAL CHEMIST

This course extends through two years of nine months each, with the student's whole time occupied with his studies and laboratory work. The three years' course for the same degree occupies the student's whole time through three school years of six months each. The program of work is the same as in the two years' course.

POST-GRADUATE COURSE

A post-graduate course is offered to Graduates in Pharmacy of other schools who have had sufficient preparation to undertake the completion of the prescribed curriculum for the degree of Pharmaceutical Chemist in one additional year. In this course the program of work is modified in each case so as to enable the student to take all the work which he has not already had.

General Statements

THE LIBRARY

The School possesses a valuable pharmaceutical reference library. It now contains 2,950 bound volumes and pamphlets. All the principal current chemical and pharmaceutical journals, foreign and

American, are received, and are accessible alike to instructors and students.

THE GENERAL PHARMACEUTICAL OR MANUFACTURING LABORATORY

This laboratory occupies a room about 60 by 40 feet, which is lighted by twelve large windows. It has individual accommodations for 288 students, the classes being arranged in four sections.

Students taking the course for the degree of Graduate in Pharmacy receive 260 hours' instruction in this laboratory and make from 150 to 200 preparations. Candidates for the degree of Pharmaceutical Chemist have, in addition, 84 hours' work in the production of organic chemical compounds.

THE GENERAL CHEMICAL LABORATORY

This room has a floor space of 1,800 square feet and individual accommodations for 216 students in three sections. It is well lighted, and good ventilation is maintained by means of an eight foot electric fan. Each student receives in this laboratory 200 hours' instruction during the first six months, and those taking the course for the degree of Pharmaceutical Chemist have 135 hours' additional practice.

THE DISPENSING LABORATORY

This laboratory is a room with a floor area of 1,450 square feet, with accommodations for over a hundred students divided into sections. From twenty to thirty students are assigned to each section.

The School of Pharmacy of Northwestern University was the first to introduce laboratory courses of instruction in the art of dispensing. Twenty-five years' practical experience has demonstrated the value of this course. Systematic training and a sufficient variety of technical work at the dispensing table can no longer be found in the retail drug store. A special dispensing laboratory is, therefore, at this time one of the most important features of the equipment of an efficient training school for pharmacists.

The dispensing laboratory of this School is equipped with an outfit of implements and apparatus many times as extensive as can be found in any drug store. Each student is taught how to use these tools in a workmanlike fashion.

Powders, pills, troches, capsules, tablet triturates, compressed tablets, ointments, plasters, suppositories and a great variety of liquid mixtures, including emulsions, are prepared under the direction of an experienced practical pharmacist.

**THE LABORATORY FOR ANALYTICAL PHARMACEUTICAL CHEMISTRY
AND FOOD AND SANITARY ANALYSIS**

This laboratory has individual work tables for sections of twenty-eight students at a time. These tables are unusually spacious, and additional work space is provided upon other large tables. Hoods and drying ovens, together with all the modern special apparatus and instruments requisite to thorough teaching, are included in the equipment of this laboratory as in the equipment of the other laboratories. Platinum dishes and crucibles and other platinum ware are supplied in ample quantity, and only the best porcelain and glass-ware is used.

The weighing room, situated between the chemical laboratories, is well equipped with good analytical balances.

Students taking the course for the degree of Graduate in Pharmacy have thirty-six lessons of three hours each in this laboratory. Students taking the course for the degree of Pharmaceutical Chemist have 240 hours' additional work.

**THE LABORATORY FOR PHARMACEUTICAL BOTANY,
MICROSCOPY AND PHARMACOGNOSY**

The floor area of this laboratory is 1,224 square feet. It is a long room, with all the work tables placed against the eight large windows on one side of the room. The light is of the kind most suitable for microscopical work.

THE MUSEUM AND EXHIBITS

The museum contains more than two thousand specimens of drugs, chemicals, pharmaceutical preparations, and other substances of medicinal or industrial importance, pharmaceutical and chemical apparatus and implements, and other articles of interest to students.

Authentic specimens of distinct varieties of plant drugs, many of great value or of special interest, are contained in these collections, including not only exceptionally fine drugs, but also spurious ones. All plant drugs used to a sufficient extent to be found in the drug markets are represented by good specimens in the museum.

The exhibits of chemical products, inorganic and organic, are exceptionally large, and the exhibits of pharmaceutical products and sick-room supplies are instructive.

Specimens of numerous kinds of chemicals and preparations manufactured by the students attest the practical character of the laboratory training given in the School.

FEES AND EXPENSES

Matriculation Fee, paid on first admission to the School, not returnable	\$ 5.00
Tuition Fees, payable half yearly in advance	
For the course leading to the degree of Graduate in Phar- macy, a year	100.00
For the course leading to the degree of Pharmaceutical Chemist, a year.....	140.00
Breakage Deposit, covering wear and tear of equipment, esti- mated at \$3.00 a year, and the breakage of apparatus, the balance being refunded at the end of the year.....	10.00
Graduation Fee	10.00

BOARD AND ROOMS

Within walking distance of the School is a quiet residence portion of the city near Lake Michigan. In this section room and board together may be obtained at from \$4.50 to \$6.00 per week. A less expensive way to live, however, is for two or several students to rent rooms together, either single rooms or ensuite, and secure their meals in one of the many excellent restaurants with which the city abounds.

Complete information regarding all of these matters may be obtained of the Y. M. C. A. secretary in the rotunda of Northwestern University building.

To assist worthy students who are compelled to earn their way while pursuing their studies the School has established an employment department. Familiarity with the business conditions in Chicago and large acquaintanceship with the druggists of the city afford unusual opportunities for placing young men in good drug stores at satisfactory remuneration. The Faculty does not recommend this double work, but if it is unavoidable, the School will gladly do all in its power to place students in satisfactory positions.

Some students find employment afternoons, evenings and at other times in miscellaneous kinds of work; through coöperation with the Young Men's Christian Association, a branch of which is a part of the equipment of the professional schools in Northwestern University Building, such places may be secured, the central location of the School making this plan easy of execution.

For further information regarding any feature of the School's work, address the Secretary, Room 414, Northwestern University Building, Lake and Dearborn Streets, Chicago, Illinois.

Officers of the Alumni Association

President, William Krizan, '96.

Vice-President, John H. Montgomery, '91.

Vice-President, Otto J. Haas, '93.

Vice-President, Leander Eicher, '97.

Treasurer, William H. Harrison, '04.

Secretary, George D. Oglesby, '91.

Trustees—Fred H. Elsner, '99; Ralph H. Smith, '94; Dr. John J. Gill, '93.

All alumni of the School are requested to keep the officers of the Association informed of changes in address. At present many cannot be reached by letters or other communications because their addresses are unknown. Inquiries at the School for such alumni cannot be answered, a fact which not infrequently is a distinct disadvantage to them.

Items of interest to the alumni will be gladly received and frequently published. Send all communications to

George D. Oglesby, *Secretary*,

Cor. 31st Street and Indiana Ave.; Chicago.

Prospective Students

Prospective students are requested to send their names and addresses with information as to age and general education. Tear off this half page on the dotted line and mail it to the School of Pharmacy of Northwestern University, 31 West Lake Street, Chicago.

As a prospective student I desire to be placed on the mailing list of the School of Pharmacy to receive circulars and other information.

My age is.....

General education

.....
I intend taking the course for the degree of

Signed

Address

.....

Register of Students 1911-1912

CANDIDATES FOR A DEGREE

SECOND YEAR

Ackemann, William Herman	Elgin
Ahl, Herbert Clarence	Moline
Bairnson, George Andrew	Chicago
Bengston, John Albert	Chicago
Bergman, Willard Louis	Chicago
Biasi, Edward Celestin	Dubuque, Ia.
Bowers, Thomas Alfred	Salida, Colo.
Brannon, Herbert Harrison	Circleville, O.
Bridges, Thomas Grover	Paragould, Ark.
Brzak, Eman John	Chicago
Byrd, Lewis Herschel	Carbondale
Campbell, William Bruce	Chicago
Cappetta, Vincent Carman	Chicago
Carlson, Gunnar Emanuel	Moline
Carr, Damon Hayes	Bloomington
Carroll, Nova B.	Cambridge, Neb.
Chiprin, Samuel	Chicago
Coleman, Coral Cornelius	Canton
Cook, Lyell Fay	Morrison
Cowan, Archibald	Milford
Daudelin, Eugene Felix	Chicago
Davis, James Duncan	Salida, Colo.
Day, Walter Jackson	Pecatonica
Doerr, Albert Edward	Chicago
Dunlap, Leland Harold	Knoxville, Iowa
Eftaxopoulos, Constantine Sotirion	Chicago
Etnyre, Lee Ernest	Oregon
Felger, Frank Fred	Norfolk, Neb.
Fieselmann, Sidney Frederick	Peoria
Frantz, Harry Earl	Winthrop, Iowa
Frizzell, Lewis	Berlin, Wis.
Frock, Lisle Price	Colo. Springs, Colo.
Garver, Clarence Earl	Bremen, Ind.
Goldman, Ada E.	Chicago
Gordon, Leslie Albert	Havana
Groome, Percy Samuel	Yankton, So. Dak.
Hatch, Arthur Clarkson	Creston, Iowa
Held, Ernest Alfred	Clay Center, Kans.
Henwood, Maxwell Butler	Prophetstown
Hopkins, Ralph Eply	Cumberland, Wis.
Huber, Paul Robert	Chicago
Irvine, Lionel Elmore	Chicago
Johnson, Chester	Chrisman
Johnson, John Elmer	Chicago
Jones, Durward	La Crosse, Ind.
Kennelley, Elmer J.	Chicago
Kimbel, Edward	Hammond, Ind.
McClean, Albert Joseph	Farley, Iowa
McDonald, James Henry	Chicago
Mars, Hartley Farnham	Newport, Minn.
Mauk, Guy	Martinsville
Miller, Joseph Benjamin	Clayton
Moffatt, Brice Pressly	Troy, Tenn.
Nandedkar, Mahader Abaji	Mhow, C., India
Nash, Will Wells	Ripon, Wis.
Needham, Francis Joseph	Victor, Colo.
Nix, Leroy Anthony	Chicago
Nussle, Eugene Otto	Granville
O'Daniel, Ellis John	Englewood
Owen, Gay	Carthage
Painter, Clinton Blair	Chicago
Palmer, Hilding F.	Morrison
Pettersen, Holger	Chicago
Potter, James Zaddock	Piggott, Ark.
Power, Jay Hohn	Portland, No. Dak.
Rennekar, Carl Clayton	Wilmette
Schaller, Frank William	Yankton, So. Dak.
Sieber, John Andrew	Evanston
Siedenfuss, John C.	Rock Island



Laboratory for Analytical Pharmaceutical Chemistry

The equipment of this laboratory affords unexcelled advantages for giving the instruction in Volumetric Analysis and Pharmaceutical Testing

Surf on the
Campus Shore





A Portion of the General Chemical Laboratory

Here the student acquires that practical knowledge and experience of chemistry that goes far to make him an expert pharmacist



Northwestern University Gymnasium at Evanston

Pharmacy students enjoy gymnasium privileges in this building

Sinclair, Scott Woodstock
 Sorlin, Oswald Chicago
 Stadelman, Oscar Lenz.....
 Mazomanie, Wis.
 Stinger, Arthur Charley. Cresco, Iowa
 Stone, Rosco Portageville, Mo.
 Strassburger, Ernest. Pewaukee, Wis.
 Stroh, Grover Rehrmes..... Oregon

Torrey, Frank Aldis....Alba, Mich.
 Turner, Hugh Arnold.....
 Faulkton, So. Dak.
 Vurpillat, Joseph Bede.....
 Winnemac, Ind.
 Wunsch, James Chicago
 Zobel, Charles Frederic..... Chicago

FIRST

*Aron, George Chicago
 Bates, Walter Everett..... Kewanee
 Beley, Fred William.....
 Livingston, Mont.
 Bengston, John Seamon..... Chicago
 Beshure, Kaiser Mike.....
 West Newton, Pa.
 Bevard, Loyd William..... Carterville
 Black, Thomas Earle..... Clayton
 Boettcher, Ferdinand Arthur. Chicago
 Buchanan, Luther Herbert. Flat Rock
 Campbell, Ralph Elgin..... Canton
 Carman, Orval E.. Las Animas, Colo.
 Chandler, Elliot Compton
 Cizek, Edward..... Osmond, Neb.
 Cotta, Raymond Erb..... Rockford
 Crouch, Elven Scott..... Fairbury
 DeRosa, Charles Chicago
 Dines, William Ralph..... Monmouth
 Donaldson, Lawson William....Polo
 Duryea, Floyd..... Hastings, Neb.
 Eggert, Emil Otto Chicago
 Finkelstein, David Edward.. Chicago
 Gaskins, Vernette Milton....
 Peterson, Iowa
 Getz, Andrew J..... Chicago
 Goodsmith, Howard Moulding
 Chicago
 Gordon, J. Everett..... Barron, Wis.
 Griffis, Willis Wesley...Lake Forest
 Griffith, Carroll Ladd..... Chicago
 Gross, Leroy Chicago
 Guzman, George Augustine..
 Pueblo, Mexico
 Hanneman, Leonard William.
 Arlington Heights
 Harp, Willard Kindred.....
 Hale Center, Texas
 Hastie, Edwin Carterville
 Henry, Lee.. Grand Forks, No. Dak.
 Herbert, John James..... Polo

YEAR

Holland, Lloyd H..... Marion
 Honig, Edward Charles..... Chicago
 Hoppe, Adam John..... Chicago
 Ishmael, Raleigh Preston.....
 Cassville, Wis.
 Jackson, Herman Roy....Westby, Wis.
 Jackson, William Henry....Chicago
 Jensen, Earl R.. Michigan City, Ind.
 Juhnke, Albert Joseph..... Chicago
 Jungknecht, Edward Robert.. Chicago
 Kaltenbach, George Martin..
 Buffalo, Wyo.
 Kupsch, Arno Walter..... Chicago
 Lando, Frederick George....Chicago
 Lawson, Oglesvie..... Denver, Colo.
 Lewis, Harry Edgar..... Harrisburg
 Lyons, Edward Martin.....
 Brodhead, Wis.
 McKee, Clifford Edwin....Morrison
 Maupin, M. Luverne.Egan, So. Dak.
 Meisner, Oscar Aemilius.....
 Davenport, Iowa
 *Meyers, Fred George..... Glencoe
 Nelson, Nels Joseph..... Joliet
 Nicholson, Albert Homer.....
 Logansport, Ind.
 Nowakowski, Peter John....Chicago
 Nussle, Frank Etienne.Lowden, Iowa
 Oglesby, Heman Francis....Chicago
 Patton, Jonathan Bedford....
 Paragould, Ark.
 Phillips, Lawrence Arthur...Harvey
 *Ralston, Frank Leslie.....
 La Grande, Ore.
 Raphael, Charles Bertram...Chicago
 Robinson, Dar Austin.Frankfort, Ind.
 Rohweder, Claus Tuscola
 Schantz-Hansen, Hans Tunis..
 Cedar Falls, Iowa
 Schultz, Herman Franklin....
 Caney, Kans.
 Simpson, Henry Franklin....Chicago

*Not in attendance

Sperling, Oscar William.....Chicago	
Sprague, Harry Burch.....Virden	Meridian, Idaho
*Staben, Theo. Willard.....Chicago	
Stein, Ralph Lawrence.....Chicago	Chicago
Stitzer, Roscoe Bernhardt.....	Peter Bertrand..
.....Boscobel, Wis.	Lewistown, Utah
Stoffregen, Hugh Martin....Chicago	Ogden, Utah
Stone, Leslie Eugene.....Woodstock	Carterville
Thompson, Donald Cameron.Chicago	Tiskilwa
Trogman, Samuel	Paris
Chicago	*Wilkins, Merritt Owen.....Chicago

SPECIAL STUDENTS

*Ackerman, Irving C.....Chicago	
Anderson, Cleon.....Ephraim, Utah	
Beck, Warren K.....Maywood	
Ekeberg, Otto.....Rockford	
Forbrick, Charles Anthony...Antioch	
Krizan, John	Chicago
Lorenz, Fred James.Sheboygan, Wis.	
Mahler, William Herman..Elmhurst	
Meyer, Raymond Stephen.....JolietOttumwa, Iowa
	Tischer, Elmer Abbott.....Peoria
	Trovillion, Loren E.....Metropolis

Graduates of 1911

PHARMACEUTICAL CHEMIST

DEGREES CONFERRED IN APRIL, 1911

James H. Dickey	Iroquois, S. Dak.
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DEGREES CONFERRED IN JUNE, 1911

Charles Clyde Anderson....Geneseo	Maurice Mayer Newman....Chicago
Edward Vincent Boarini....Chicago	Mary Cecelia Nolan.....Chicago
Robert Emmett Coughlan....Chicago	Arnold Fred Schaettgen.....
Thomas Francis Heffernan..ChicagoDubuque, Ia.
Herbert Ernest Hillebrecht.....	Roy Page Stewart.....Chicago
.....Columbia, S. C.	Robert Walter Weech....Elgin, Ore.
Edward Samuel Kaufmann.....	Walter Heli Wyszynski....Chicago
.....Youngstown, O.	

GRADUATE IN PHARMACY

DEGREES CONFERRED IN APRIL, 1911

Charles Clyde Anderson....Geneseo	Leo Melville Cady, Grand Junc., Colo.
Lee Henry Andre....Mechanicsville	Lloyd Bruce Campbell.....
David Baxter.....Montague, Mich.New Plymouth, Ida.
Edward Vincent Boarini....Chicago	Jay J. Cook.....Iron Mt., Mich.
Roy Elmer Buck.....Genoa	Robert Emmett Coughlan....Chicago

*Not in attendance

Eugene Felix Daudelin.....	Chicago	Albert James Kohlman.	Dubuque, Ia.
Harold Pericles Dereby.....	Chicago	Raymond Robert Little.....	Leon, Ia.
Robert Walter Donaldson.....	Polo	Carl August Mackh.....	Elgin
Harry Millur Donichy.....	Morrison	Henry Farris Miller.....	Olin, Ia.
Madison Clayton Donnell.....		William Seegmiller	Musser.....
	El Paso, Texas		Salt Lake, Utah
Constantine S. Eftaxopoalos..	Greece	Graham William Nesbit..	Ogden, U. S.
Samuel Eppelsheimer..	Griswold, Ia.	Maurice Mayer Newmann..	Chicago
Charles Leo Gimbel..	Davenport, Ia.	Mary Cecilia Nolan.....	Chicago
John Phillips Halliwell..	Odessa, Neb.	Walter Otto Nolting.....	Freeport
Selmer Hanson	Canton, S. Dak.	Edward Louis Park.....	Chicago
Thomas Francis Hefferman..	Chicago	Walter Leon Pulley.....	Marion
Alfred Hendrickson	Bismarck, N. Dak.	Arnold Fred Schaettgen	Dubuque, Ia.
Waldemar Harold Hendricksen..		Thomas Henry Schopp.....	Odell
	Chicago	Roy Page Stewart.....	Chicago
Fred LeRoy Hill.....	Kewanee	Walter Oliver Stoll.....	Joliet
Herbert Ernest Hillebrecht.....		Charles Benton Stoltz	Casey
	Columbia, S. C.	Earnst Strassburger	Chicago
Clifford Paul Hoaglund.....		Winfred Erle Tanner..	Lewistown
	Ottumwa, Ia.	James William Wade.....	Fairbury
Oscar H. Johnson.....	Chicago	Robert Walter Weech..	Elgin, Ore.
Bert Napoleon Johnson.....	Batavia	Fred Douglas Wilson.....	Meridian, Miss.
Melvern Lloyd Johnson		Arthur Aaron Zieske ..	Watertown
	Laramie, Wyo.	John Zwack	Chicago
Edward Samuel Kaufmann	Youngstown, O.		

DEGREES CONFERRED IN JUNE, 1911

George Emmanuel Bull....	Chicago	Leslie Anthelm Schoen..	Victor, Colo.
Clarence William Parker		Raymond Joseph Thoma....	Chicago
	Lisbon, N. D.		
Frederick Wills Patton			
	Waupun, Wis.		



Northwestern University

¶ THE COLLEGE OF LIBERAL ARTS, located at Evanston, in an ideal college community, offers special preparation for the professions, and for pursuits requiring broad training.

¶ THE MEDICAL SCHOOL is one of the oldest, largest, and best equipped. Seven hospitals are open to students. Clinic material is abundant.

¶ THE LAW SCHOOL, the oldest law school in Chicago, offers unexcelled library facilities and special courses that prepare for immediate practice in any state upon graduation.

¶ THE COLLEGE OF ENGINEERING has its own building just completed, beautifully situated, a model of efficiency. Offers courses in all branches of Engineering. Technical studies in a University environment.

¶ THE SCHOOL OF PHARMACY offers a scientific training in Pharmacy, Chemistry, and Drug and Food Analysis. Special courses for Drug Clerks.

¶ THE DENTAL SCHOOL offers expert training in theory and practice. Facilities are unsurpassed. Its clinic is the largest in the world.

¶ THE SCHOOL OF MUSIC affords a scientific preparation for music as an accomplishment and a profession. It is located at Evanston.

¶ THE SCHOOL OF COMMERCE provides instruction in economics, elementary and corporation finance, commercial law and accounting. Many lecturers from business and professional life.

¶ EVANSTON ACADEMY prepares for college, for engineering, for professional schools, and for business.

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